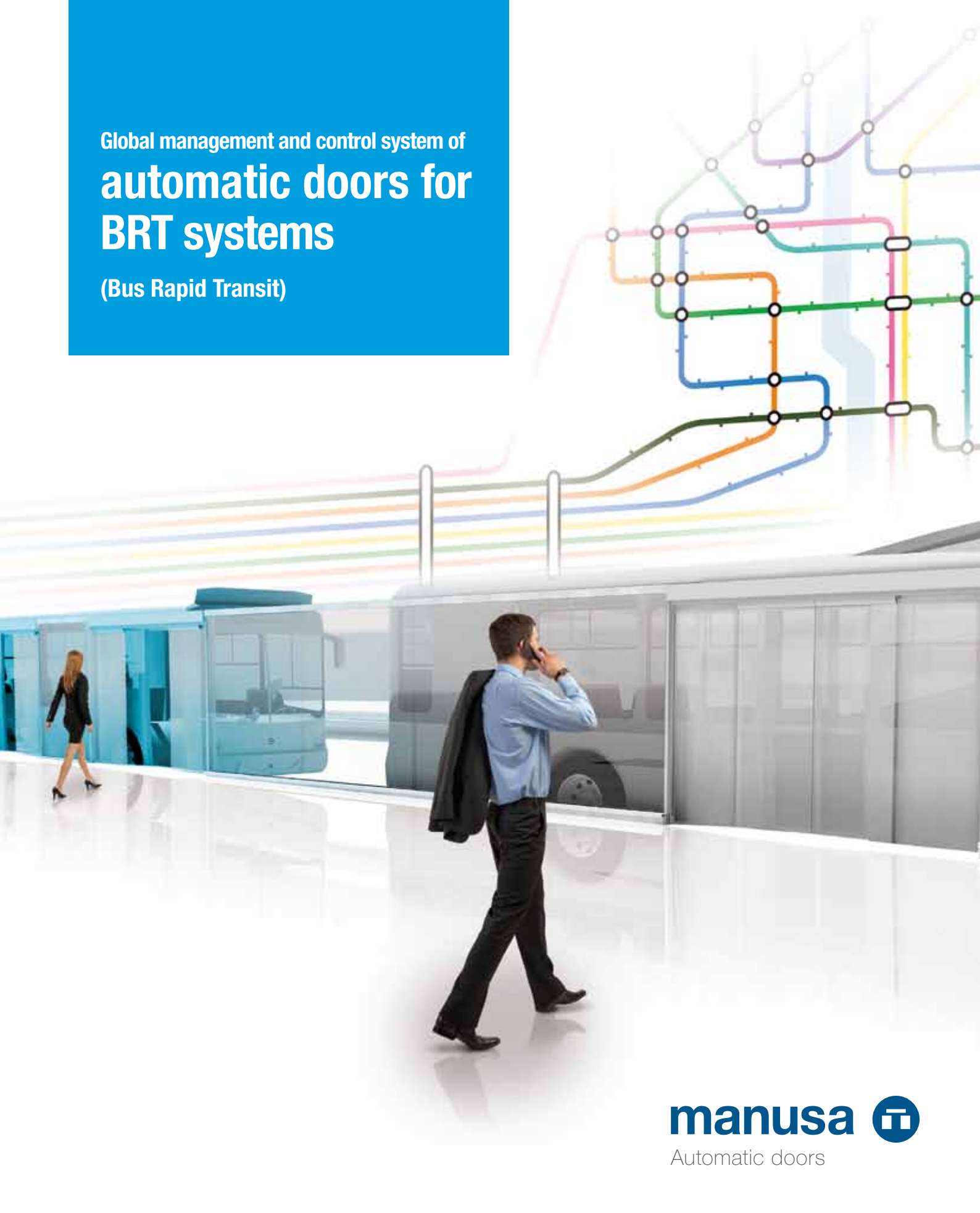


Global management and control system of
**automatic doors for
BRT systems**

(Bus Rapid Transit)



What is it?

It is an integrated system of automatic doors for BRT stations that synchronises opening and closing of dock and bus doors automatically, safely and in coordination.

The system can be fully integrated into the station architecture, is easy to install and requires little maintenance. Other station systems (ticket gates, lighting control, climate control, commuter communications, etc.) can also be integrated in the system's control equipment.

The Manusa BRT control system has been designed for intensive use and adapts perfectly to any infrastructure. The system can even be designed and implemented on the basis of the existing infrastructure.

How does it work?

When the vehicle arrives at the dock and is correctly placed in front of the dock doors, they may be opened either manually by the driver or automatically, after a programmed delay agreed with the client.

Once all the passengers have got on or off the bus, the driver closes the bus doors and leaves the dock as soon as all its dock doors are closed.

What does it consist of?

The system consists of four elements:



Vehicle positioning system



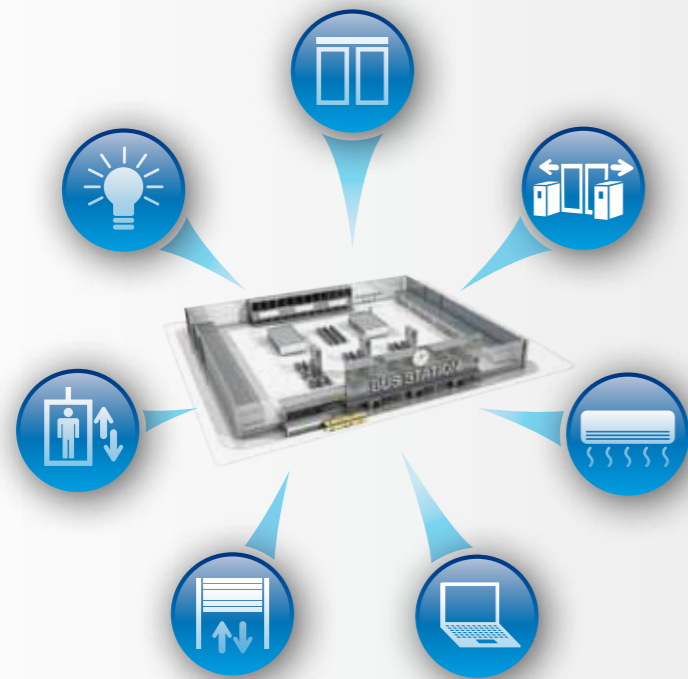
Communication system



Automatic doors



Scalable management system



The system can be integrated with the control of other station elements.



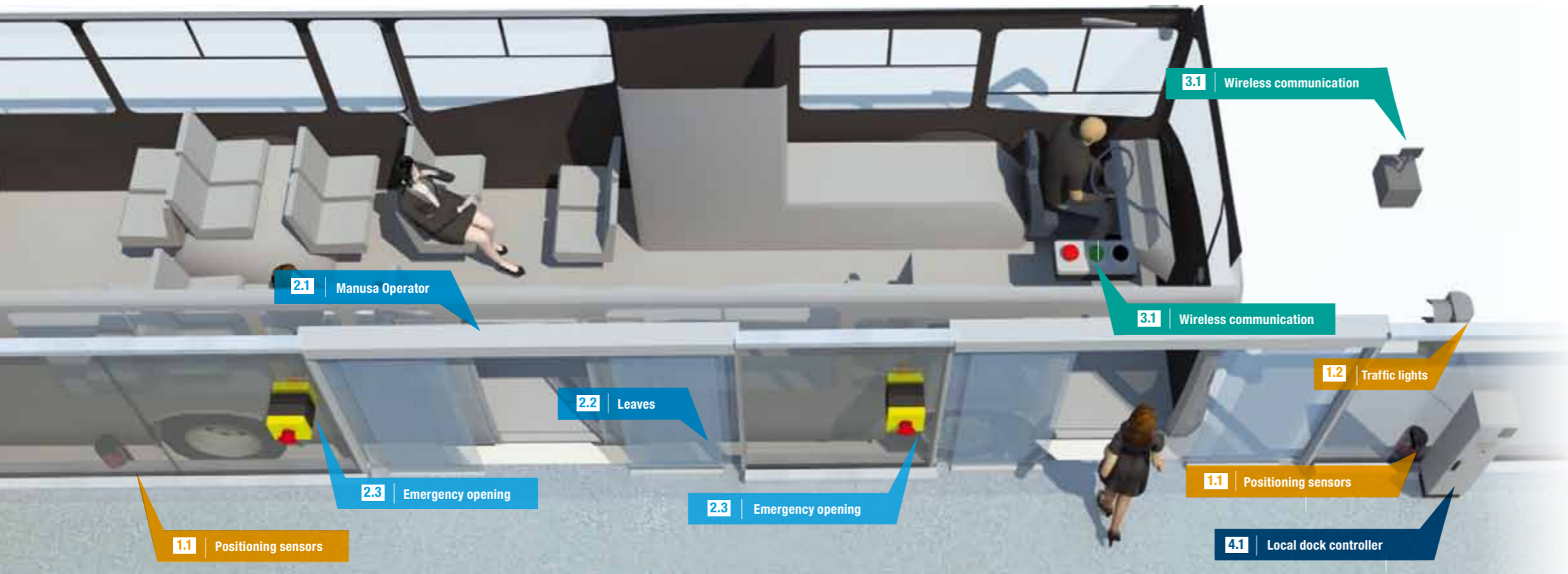
What does it consist of?

Vehicle positioning system

The system consists of a series of devices in the stations and on-board the vehicles that coordinate the opening of dock doors.

Some of the components are as follows:

- 1.1 Positioning sensors:** detect if the bus is correctly placed with its doors aligned to the dock doors.
- 1.2 Traffic lights:** show the driver when the bus is placed in the correct position and the status of the dock doors.



Automatic doors

The automatic doors that close the dock use a Manusa Visio operator, that features the highest performance, and a series of moving and fixed door leaves forming a modular unit that can be adapted to any infrastructure, whether new or in use.

To ensure the safety of commuters, the doors have a series of sensors and safety devices.

They consist of the following main elements:

- 2.1 Operator:** automatic door actuating device, with inverter technology.
- 2.2 Leaves:** several aluminium profiles available, with all the design and safety requirements.
- 2.3 Emergency opening:** optional pushbutton to open the door safely if necessary, in one or both sides of the dock door.
- 2.4 Safety sensors:** photocells or AIR sensors to avoid contact of users with door leaves.
- 2.5 Break-out system:** opens the doors by batteries in the event of emergency or failure of the power supply.
- 2.6 People counting:** optional system to count the number of people getting on or off the bus.



Communication system

The communication system is based on a programmable logic controller or PLC that supervises vehicle positioning and manages all the opening and closing orders of the dock doors.

- 3.1** Device that allows **wireless communication** between bus and dock by a radiofrequency system, making the opening and closing of the dock doors in coordination with bus doors, either automatically or through driver action.

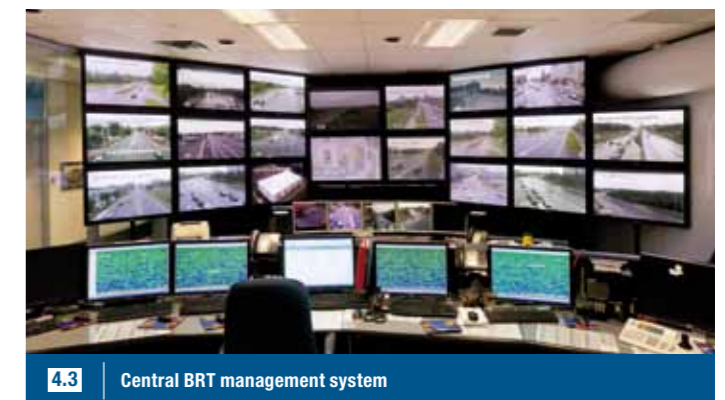
Scalable management system

Like the dock screen doors, the opening and closing system is a scalable, modular system that can easily be expanded if required by the network:




- 4.1 Local dock controller:** contains all the necessary elements to control a single dock.

- 4.2 Local station controller:** centralises all the information from the several docks in the station on a single screen, so they can be controlled from a single point.


- 4.3 Central BRT management system:** controls all the stations in the bus network from a single point, displays statuses, alarm logs and events and can be used to issue line operation management reports.




Advantages of Manusa BRT System

-  Scalable
-  Versatile
-  Smart



 **Scalable.** The system is able to grow and expand as needs arise.

 **Versatile.** The systems is able to cater all control and safety needs.

 **Smart.** The system is able to identify the different vehicles in the different lines, and makes the opening for every vehicle in its corresponding dock. This feature is especially important in networks with multiple bus lines and docks.

Configuration

Manusa BRT system is scalable to meet the needs of automation, control and security. Each project can be customized and is expandable to adapt to the growth of the BRT system.



manusa

Automatic doors



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