Recommendation **Dimensions in mm** **Edition 2016 (20230627)**
(First English Edition)

1. Purpose of the Standard

This standard establishes 18-pin interfaces[1)] to enable the secure and fast installation or exchanging of electronic modules for electronic components (loco and function decoder) in areas of limited space. The interfaces are thus suitable for vehicles of scale N and TT as well as small vehicles of scale H0.

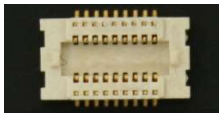
2. Interface Description

This interface is deployable with cored DC motors and coreless DC motors. There are variants Next18 without sound, and Next18S with sound function. It is not intended, and should it should be avoided, that one installs a Next18 decoder into vehicles designed for a Next18S decoder.
The interface provides up to 7 function outputs. It is not required that all functions of the interface be supported. Connections for functions that are not supported must remain unconnected. This applies to both vehicles and other equipment in which the socket portion is installed, as well as for decoders or other equipment where the plug portion is installed. The installation volume as well as the size of the decoder are a part of the interface.

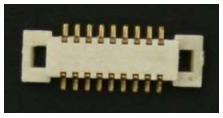
Vehicles with factory installed interfaces in accordance with this standard must clearly indicate on their packaging whether the interface is of version Next18 or Next18S.

2.1 Mechanical Characteristics

The interface is composed of a encapsulated 18-pin socket strip on the motherboard of the vehicle and an also encapsulated 18-pin plug strip on the circuit board of the decoder.



Socket Strip (in the vehicle)



Plug Strip (at the decoder)

The security against incorrect connection orientation and protection against erroneous installation is guaranteed through the symmetric assignment of the electrical connections and via the corresponding installation volume limitations in vehicles.

[1)] This recommendation is based on the RailCommunity standard RCN-118

2.1.1 Decoder

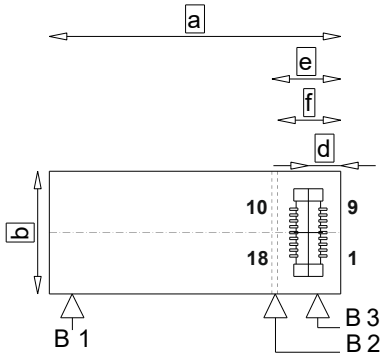
For the decoder, the variants Next18 without sound function and Next18S with sound function are differentiated:

Table 1:

Dimension	Description	Next18	Next18-S
a	Decoder-Length	15.0 mm	25.0 mm
b	Decoder-Width	9.5 mm	10.5 mm
c	Decoder-Height	2.9 mm	4.1 mm
d	Distance from board edge to plug center line	2.5 mm	2.5 mm
e	Distance from board edge to components with max. height of 0.5mm	5.4 mm	5.4 mm
f	Distance from board edge to components with max. height of 1.5mm	5.9 mm	5.9 mm

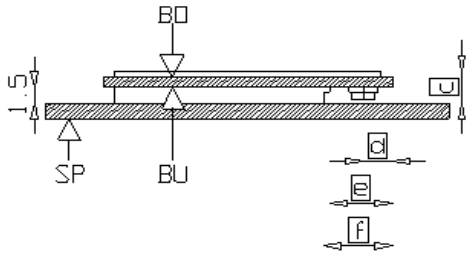
2.1.2 Decoder Installation

The installation space in the locomotive must be designed such that components of the decoder cannot touch bare metal or conductive paths. The installation space (dimensions per Table 1) should be dimensioned such that the decoder fits without restriction.



B1 = Components with max. height 1.5 mm permitted
B2 = Components with max. height 0.5 mm permitted
B3 = Components in this region not allowed

View from below, component side of the plug



SP = Motherboard
BO = Components above
BU = Components below

Decoder side view

The maximum component height on the bottom of the electronic components is 1.5mm. The maximum component height on the top side of electronic components is computed out of the maximum height of the decoder minus the component height below (1.5mm) and the thickness of the utilized circuit board.

2.2 Electrical Characteristics

Contacts may be driven with a maximum of 0.5 A. The connections for power delivery as well as U+ and GND (decoder plus and minus after rectifier) are each implemented with two contacts each. The maximum load on these connections is thus 1.0 A.

2.3 Pin assignments

Table 2a: Next18

Description	Pin #	Pin #	Description
Power pickup right	1	18	Power pickup right
Motor +	2	17	F0_r
AUX1	3	16	AUX5
AUX3 / Train bus -Clock[1)]	4	15	U+
GND	5	14	GND
U+	6	13	AUX4 / Train bus -Data [1)]
AUX6	7	12	AUX2
F0_f	8	11	Motor -
Power pickup left	9	10	Power pickup left

Table 2b: Next18S

Description	Pin #	Pin #	Description
Power pickup right	1	18	Power pickup right
Motor +	2	17	F0_r
AUX1	3	16	LS_A [2)]
AUX3 / Train bus -Clock[1)]	4	15	U+
GND	5	14	GND
U+	6	13	AUX4 / Train bus -Data [1)]
LS_B [2)]	7	12	AUX2
F0_f	8	11	Motor -
Power pickup left	9	10	Power pickup left

The circuit boards of the vehicles as well as the decoders must be constructed such that the varied uses of pins AUX5 / 6 doesn't lead to damage on the vehicle nor the decoder.

2.4. Signal Descriptions:

Table 3:

Name	Description
Power pickup right	Power pickup right (in direction of forward travel), 2 contacts are utilized to increase the current load capacity
Power pickup left	Power pickup left (in direction of forward travel), 2 contacts are utilized to increase the current load capacity
Motor +	Motor connection positive (connected to power pickup right)
Motor -	Motor connection negative (connected to power pickup left)
F0_f	Light during forward direction of travel
F0_r	Light during backwards direction of travel
AUX1	Function out 1 or Tail lights during forward definition of travel
AUX2	Function out 2 or Tail lights during backward definition of travel
AUX3 / train bus clock	Function out 3 (logic signal, no power output) or train bus clock (logic signal)
AUX4 / train bus data	Function out 4 (logic signal, no power output) or train bus data (logic signal)
LS_A / AUX5	Speaker connection A for Next18S or Function out 5 for Next18 (logic signal, no power output)
LS_B / AUX6	Speaker connection B for Next18S or Function out 6 for Next18 (logic signal, no power output)
GND	Decoder negative after rectifier, 2 contacts are utilized to increase the current load capacity
U+	Decoder positive after rectifier, 2 contacts are utilized to increase the current load capacity. This output is used to supply the functions and/or for connection external buffer capacitors. The limiting of power up current for external buffer capacitors must be done on the vehicle side of the interface.

[1)] The processor pins of the train bus are made available with a maximum 470 Ohm series impedance.
[2)] The speaker impedance is in the range of 4 to 8 Ohms and is to be documented by the manufacturer.

2.4.1 Description of Function Outputs

The function outputs F0_f, F0_r, AUX1 and AUX2 are intended to switch loads (power outputs). The loads are switched on by the decoder connecting the respective function outputs to ground via an electronic switch. The maximum load current on the function outputs is 100 mA.

2.4.2 Description of Logic Signals

The logic signals of the connections AUX3 to AUX6 are suited to activate external load switches (such as on the motherboard of the vehicle). The maximum load current of logic outputs is 2 mA.

Table 4:

	Voltage level at output of the decoder	Voltage level for the load switch (on the motherboard of the vehicle)
Function switched off	≤ 0.4 Volt	≤ 0.8 Volt
Function switched on	≥ 2.4 Volt	≥ 2.0 Volt

2.4.3 Usage of the Interface on Function Decoders

This interface can be deployed in vehicles without motors (e.g. control cab cars). Since the motor connections would remain disconnected in this case, the decoder should ensure the appropriate feedback signaling in service mode via internal circuitry.

3. Operation without Decoder

For the operation of a vehicle without the installation of a decoder in the interface, a plug strip as bridge is to be used. This bridge plug connects the following contacts to each other:

Power pickup right – Motor+ – F0_r – (AUX1, when connected to tail light in forward direction of travel)
Power pickup left – Motor- – F0_f – (AUX2, when connected to tail light in reverse direction of travel)

Table 5:

Name	Pin #	Pin #	Name
Power pickup right	1	18	Power pickup right
Motor +	2	17	F0_r
AUX1	3	16	LS_A / AUX5
AUX3 / train bus clock	4	15	U+
GND	5	14	GND
U+	6	13	AUX4 / train bus data
LS_B / AUX6	7	12	AUX2
F0_f	8	11	Motor -
Power pickup left	9	10	Power pickup left

A vehicle motherboard produced voltage U+ may not be connected to the pin 6 (U+) of the decoder.

4. Specification of Components for Plug Strip and Socket Strip

Plug strip type Series CT0519P, Socket strip type Series CT0519S

Source:
CORATEC GmbH & Co. KG
Am Naugarten 8
DE - 35116 Hatzfeld
Germany

Phone: +49 (0) 6452 93 27 30
Mobile: +49 (0) 172 1 85 49 20
Fax: +49 (0) 6452 93 27 29
i.planert@coratec.de http://www.coratec.de