

LocControl100

General operating instructions

(customer-specific aspects are described in a separate document)

Document no. 10.0296.6600.02

Version N

Author: Gerhard Jordi

The contents of this manual are the intellectual property of Schweizer Electronic AG. No user rights to patents or other property rights are granted to third parties through its acquisition. All rights remain with Schweizer Electronic. Except with our express permission, this manual may not be copied or duplicated, either completely or partially, and it may not be communicated or made accessible to third parties.

Contents

0	DOCUMENT INFORMATION	4
0.1	DOCUMENT OBJECTIVE	4
0.2	VERSION CONTROL	4
1	INTRODUCTION	5
1.1	GENERAL REMARKS	5
1.2	ISED RSP-100 NOTICE:	6
2	PICTOGRAMS	7
3	LOCCONTROL100 COMMISSIONING AND MAINTENANCE CONCEPT	8
3.1	INTRODUCTION	8
3.2	COMMISSIONING ENGINEERS' ACTIVITIES:	8
3.3	MAINTENANCE ENGINEERS' ACTIVITIES:	8
3.4	OPERATOR	8
3.5	MANUFACTURERS	8
3.6	PERSONNEL COMPETENCE	8
3.7	QUALIFICATION OVERVIEW	9
3.8	THE SERVICE ORGANIZATION	9
4	DEVICE DESCRIPTION	10
4.1	OPERATING PRINCIPLE	10
4.2	TRANSMITTER	10
4.3	RECEIVER	10
4.4	RECEIVER ← → TECHNICAL UNIT INTERFACE	10
5	SYSTEM SECURITY	11
5.1	ADDRESSING	11
5.2	TRANSMISSION SECURITY ON THE RADIO CHANNEL	13
6	STANDARDS, GUIDELINES AND COMPANY-INTERNAL REGULATIONS	13
6.1	STANDARDS, GUIDELINES AND COMPANY-INTERNAL REGULATION HIERARCHY	13
6.2	OBSERVED STANDARDS	13
6.3	RADIO MODULE „MSY“ NOTIFICATIONS	14
6.4	LOCCONTROL100 RS NOTIFICATIONS	14
7	INTENDED USE OF THE RADIO REMOTE CONTROL	14
8	SAFETY INFORMATION	15
8.1	GENERAL SAFETY INFORMATION	15
8.2	GENERAL OPERATING SAFETY GUIDELINES	15
8.3	SAFETY INFORMATION FOR OPERATION	16
8.4	COMPORMENT IN EMERGENCY SITUATIONS	16
9	COMPORMENT IN CASE OF THUNDERSTORMS	16
10	TRANSMITTER	17
10.1	TECHNICAL DATA - TRANSMITTER	17
10.2	CARRYING HARNESS FOR THE SCHWEIZER ELECTRONIC TRANSMITTER MODEL	17
10.3	USE OF OPERATOR'S OWN CARRYING HARNESS	18
10.4	TRANSMITTER OPERATION WITH TRANSMITTER HOLDER	18
11	LITHIUM-ION BATTERIES	19
11.1	CARE WHEN DEALING WITH LITHIUM-ION BATTERIES (AKKUPACS)	19
11.2	BATTERY EXPIRY DATE	19
11.3	DISPOSAL OF BATTERIES	19
12	RECEIVER	20
12.1	TECHNICAL DATA - RECEIVER	20
13	RECEIVER ANTENNA	20
14	MOUNTING THE RECEIVER, TRANSMITTER HOLDER AND ANTENNA	20
15	MALFUNCTIONS	21
15.1	TRANSMITTER MALFUNCTIONS	21

15.2	RECEIVER MALFUNCTIONS.....	21
15.3	BATTERY CHARGER MALFUNCTIONS.....	21
15.4	RADIO MALFUNCTIONS BY EXTERNAL INFLUENCES	21
16	OPERATING DATA	22
16.1	DATA ACQUISITION.....	22
16.2	OPERATING DATA READOUT	22
17	OPENING THE LOCCONTROL100 TRANSMITTER AND RECEIVER.....	22
18	MAINTENANCE OF THE LOCCONTROL100 SYSTEM	23
19	LOCCONTROL100 SAFETY TEST EVERY THREE YEARS	23
20	SERIAL NUMBER MANAGEMENT AND TRACEABILITY.....	24
21	DISPOSAL	24
22	LIMITED MANUFACTURERS GUARANTEE	25
22.1	GUARANTEE DECLARATION	25
22.2	EXCLUSIONS FROM THE MANUFACTURER'S GUARANTEE.....	25
22.3	GUARANTEE CLAIMS	26
22.4	GUARANTEE EXCLUSIVITY	26
22.5	LIMITATION OF LIABILITY	27
22.6	APPLICABLE LAW AND COURT OF JURISDICTION	27
23	FURTHER USER INFORMATION.....	28
23.1	FCC INTERFERENCE STATEMENT, PART 15.105(B)	28
23.2	FCC PART 15.21 WARNING.....	28
23.3	FCC PART 15.19(A) STATEMENT	28
23.4	FCC/ISED RF EXPOSURE GUIDANCE STATEMENT	28

0 Document information

0.1 Document objective

This document describes the general operation of the LocControl100 radio remote control for railways and railway vehicles.

This manual does not cover customer-specific aspects, which are covered in separate documents.

0.2 Version control

V.	Status	Who	When	Changes to the previous version
A	Replaced	PEK	16.03.2008	Follows the Version
B	Replaced	GJO	01.07.2008	
C	Replaced	GJO	16.07.2008	
D	Replaced	GJO	28.07.2008	
E	Replaced	RBU	03.11.2009	
F	Replaced	RBU	14.12.2009	
G	Replaced	RBU	18.01.2010	
H	Replaced	RBU	27.01.2010	
N	Active	MRA	25.11.2015	Chapter 6.3/6.4 added

Status: Draft Document in draft stage.

Replaced This document is no longer valid and has been replaced by one or more others.

Obsolete Document is no longer valid and has not been replaced.

Review Document is frozen in order to carry out a review.

Active Document has been released.

1 Introduction

1.1 General remarks



LocControl100 transmitter
German Railways (DB) execution

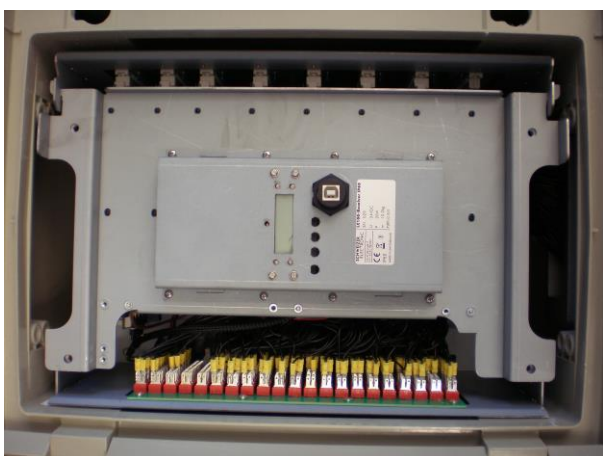
The illustrations in the user handbook are sample photographs.
Customer-specific executions may appear different.

The LocControl100 radio remote control for shunting locomotives, railway vehicles and similar vehicles has been developed according to both the latest technical knowledge and the latest version of European standard EN 50239.

During the construction and manufacture of this device, attention was paid to the relevant regulations concerning the safety of persons and things.



19-inch rack execution for German Railways



LocControl100 receiver
IP65 housing execution
Swiss Federal Railways SBB

1.2 ISED RSP-100 Notice:

“This device complies with Industry Canada’s licence-exempt RSSs. Operation is subject to the following two conditions:

- (1) This device may not cause interference; and
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.”

“Le présent appareil est conforme aux CNR d’Industrie Canada applicables aux appareils radio exempts de licence. L’exploitation est autorisée aux deux conditions suivantes :

- 1) l’appareil ne doit pas produire de brouillage;
- 2) l’appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d’en compromettre le fonctionnement.”

2 Pictograms

In order to improve user understanding, these operating instructions use the following pictograms.



This explanatory note gives useful advice and tips for better operation, performance improvement and reliability of the radio remote control.



This explanatory note draws attention to potentially dangerous situations and indicates that mishandling could result in severe damage to the radio remote control, the locomotive or the general railway infrastructure.

Whenever work is being carried out, attention must be paid to this safety warning, as well as to the applicable safety regulations at the workplace.



This advice draws attention to dangers in the fields of electrical engineering and electronics.

Work on electrical and electronic assemblies and LocControl100 components should only be carried out by a fully-qualified electrical engineer having a training certificate from the Schweizer Electronic Group.

It is imperative that this information be heeded *before* the radio remote control is used.

3 LocControl100 commissioning and maintenance concept

3.1 Introduction

Carrying out commissioning and maintenance work on LocControl100 devices are subject to CENELEC regulations and may only be performed by organizations and/or persons who fulfil the provisions defined in this document.

Commissioning and maintenance work is under the control of Schweizer Electronic AG.

The commissioning and maintenance concept determines how the commissioning and maintenance work on LocControl100 devices and system components has to be carried out.

The commissioning and maintenance concept comprises following activities:

3.2 Commissioning engineers' activities:

Typical commissioning engineers' activities are:

- Cleaning work and function controls of LocControl100 sealed transmitters and receivers
- LocControl100 RS mounting and commissioning, including acceptance of locomotives
- Reading LocControl100 RS operating data from USB interfaces

3.3 Maintenance engineers' activities:

Typical maintenance engineers' activities are:

- Reading LocControl100 RS operating data from USB interfaces
- Replacement of "non-serial-number-managed" parts on LocControl100 RS transmitters and receivers
- Carrying out LocControl100 RS function and final tests
- Affixing device seals to LocControl100 RS transmitters and receivers
- LocControl100 RS mounting and commissioning, including locomotive acceptance test

The LocControl100 commissioning and maintenance concept concerns all system components.

3.4 Operator

Operators are companies that operate radio remote controlled locomotives and carry out commissioning work on radio remote control systems using their own personnel. Operators are responsible for the qualitative formation of their personnel (commissioning and maintenance engineers I) and adhere to Schweizer Electronic's standards and directives.

3.5 Manufacturers

Manufacturers are companies that manufacture radio remote controlled locomotives and carry out the installation of radio remote control systems and commissioning work using their own personnel. Manufacturers are responsible for the qualitative formation of their personnel (commissioning and maintenance engineers I) and adhere to Schweizer Electronic's standards and directives. Training of their project planners and assembly mechanics.

3.6 Personnel competence

Commissioning and maintenance work on LocControl100 system components should only be carried out by qualified and trained personnel.

Only qualified persons who have successfully completed the appropriate Schweizer Electronic training courses should maintain the LocControl100.

→ See chapter 22.2 Exclusions from the manufacturer's guarantee

Training offers are regularly published or, on customer request, individually arranged by Schweizer Electronic. Schweizer Electronic monitors participants and issues a certificate to those who successfully complete their formation.

3.7 Qualification overview

Function	Qualified for the following activities	Responsible for training	Support for training	Schweizer Electronic certificate description
Operative	May work with LocControl100 RS	Operator	Schweizer Electronic	
Commissioning engineer	May mount LocControl100 RS transmitters and receivers on locomotives, carry out commissioning and acceptance tests as well as carry out activities according to the "Commissioning" training stage	Schweizer Electronic		Commissioning engineer for the mounting and commissioning of LocControl100 RS according to the "commissioning" training stage
Commissioning engineer I	May carry out commissioning and maintenance activities on LocControl100 transmitters and receivers according to the "Maintenance 1" training stage	Schweizer Electronic		Maintenance engineer I for LocControl100 RS maintenance according to the "maintenance" training stage
Commissioning engineer II	May carry out commissioning and maintenance activities on LocControl100 according to the "Maintenance II" training stage	Schweizer Electronic		Schweizer Electronic personnel

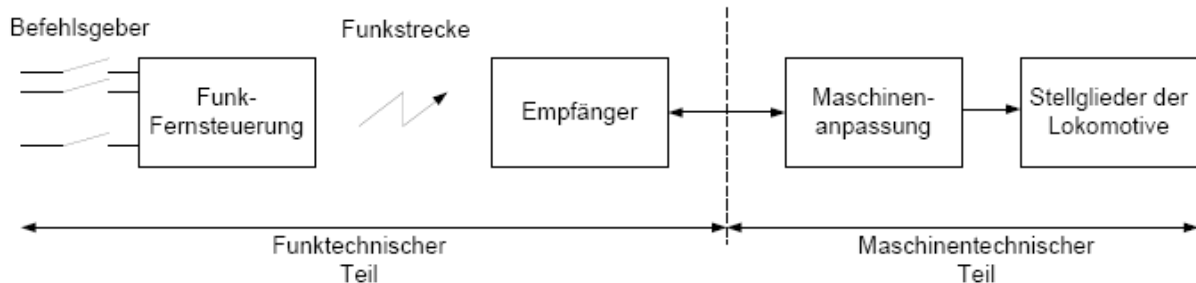
3.8 The service organization

As the manufacturer of the LocControl100, Schweizer Electronic possesses the necessary prerequisites for supporting LocControl100 RS partners. A service organization is available for authorized partners and supports these in both technical and logistics areas.

Please consult our homepage www.schweizer-electronic.ch for the current service organization.

4 Device description

4.1 Operating principle



Operating principle of the LocControl100 radio remote control

4.2 Transmitter

Operatives can give instructions by means of the transmitter's command controls.

The command controls are:

- "Manual stop" palm button
- Switches
- Buttons
- Combined switch-buttons
- Traction/Brake switch (joystick), uniaxial or biaxial

These commands are converted into radio telegrams in the transmitter (control unit).

These radio telegrams are then sent via a secure, monitored and encrypted radio link to a unique radio remote control receiver dedicated to the transmitter.

4.3 Receiver

The receiver, mounted on a locomotive (or similar vehicle), converts the radio signals received into commands, which it passes on to the technical unit (locomotive computer) in the form of electrical signals.

With the LocControl100, it is also possible to send return messages from the technical unit via the receiver to the transmitter. This is called bidirectional radio traffic.

4.4 Receiver \leftrightarrow technical unit interface

The interface between the LocControl100 radio remote control and the technical unit is the output of the LocControl100 receiver.

Up to this interface, Schweizer Electronic assumes technical safety responsibility for the product.

The "technical radio part" of the LocControl100 radio control ends at this interface.

5 System security

The transmitter and receiver electronics each consist of a bi-processor system.

Monitoring electronics compares all telegrams received for their validity and only executes the commands received if there is compliance (valent – antivalent) of both computers' evaluation.

All the requirements of EN 50239, in particular safety-relevant functions, have been fulfilled for all safety-relevant order issuance possibilities.

The LocControl100 is suitable for uses of software security performance level 3 (EN 50128) and SIL3 (EN 50129).

5.1 Addressing



Every installation is assigned a unique built-in address. This address is allocated by Schweizer Electronic once worldwide.

The addressing is memorized in the receiver and inscribed on the receiver's front panel.

A transmitter can be dedicated to a receiver (of a locomotive), by equipping the transmitter with a closed RFID slot.



Execution with closed RFID slot



RFID key with engraved radio identification number (addressing)

A transmitter with an open RFID slot can be variably dedicated to a receiver (a locomotive) by plugging the transmitter's corresponding RFID key, which belongs to the receiver of the locomotive to be controlled, into the RFID slot. This therefore ensures that a particular locomotive can be controlled with a transmitter of the same project.



Execution with open RFID slot

Addressing ensures the unique assignment of transmitter remote controls to receiver remote controls when operating several radio remote controls at the same frequency.

5.2 Transmission security on the radio channel



In order to ensure validity and security with regard to telegram interference over the radio channel, the following measures are met:

- Telegram security according to EN 60870-5-1
- Telegram transmission (incl. encryption) according to EN50159-2
- Monitoring of configured telegram length
- Telegram security by relative and absolute time monitoring

6 Standards, guidelines and company-internal regulations

6.1 Standards, guidelines and company-internal regulation hierarchy

The hierarchy of documents which describe and regulate the function and use of radio remote controls for the remote control of railway vehicles is defined as follows:

Hierarchy	Documents
Highest level	EN 50239 standard and referenced standards
Subordinated level	Guidelines, such as BGR 122 Operation of radio controls on railways VDV-211 Conditions for the design of radio control installations on railways
Lowest level	In-house directives, such as operating manuals, working directives and other documents

6.2 Observed standards

- European standard EN 50239 concerning the security requirements of radio remote controls for locomotives, including all referenced standards
- Telegram security according to EN 60870-5-1
- Telegram transmission according to EN50159-2
- Software security performance level 3 according to EN 50128 and SIL 3 according to EN 50129
- Radio standard EN 300-113

6.3 Radio module „MSY“ notifications

Overview-table for placing on the market of radio module from RF Data according to article 6(4) to the directive 1999/5/EG.

Country	Organisation	Register-Number	issued
Austria	Office for broadcasting and telecommunication-installations	BMFIT-640.825/0817-III/BFT/2009	10.12.2009
Germany	Bundesnetzagentur, Saarbrücken	7910801	06.01.2010
Switzerland	BAKOM	none	19.01.2010
Belgium	BIPT	none	24.02.2010
France	Agence Nationale des Fréquences	ANFR/DTCS/RTTE/17601-10/LL	29.01.2010

6.4 LocControl100 RS notifications

Overview-table for placing on the market of LocControl100 RS according to article 6(4) to the directive 1999/5/EG.

Country	Organisation	Register-Number	issued
Austria	Office for broadcasting and telecommunication-installations	BMVIT-640.825/0817-III/BFT/2009	10.12.2009
Germany	Bundesnetzagentur, Saarbrücken	7910801	06.01.2010
Switzerland	BAKOM		
Belgium	BIPT		

7 Intended use of the radio remote control



Radio remote control is intended for use with rail-based vehicles in shunting operations and on railway sections.

Any other use may only be made with the agreement of Schweizer Electronic.

Schweizer Electronic cannot be held responsible for damages caused by non-intended use.

The intended use also includes the observation of this "LocControl100 General Operating Instructions" user manual as well as the provisions and directions contained therein.

8 Safety information

8.1 General safety information



LocControl100 is a technically sophisticated product. Nevertheless, danger can arise from the product if it is operated or repaired by insufficiently trained persons, or if it is not used as intended. Schweizer Electronic therefore strongly urges you to familiarize yourself with the operating manual as well as the instructions provided with the product, and to adhere strictly with the provisions provided therein.



Before delivery, the radio control was tested on the test bench and packed in perfect condition. The test data is preserved by Schweizer Electronic and Schweizer Electronic's authorized service stations throughout the whole of the device's lifespan.



All the specified measures and indications relating to operating safety, points of general safety and accident prevention which were implemented or observed before, during or after a start-up, must be strictly complied with by the operator and his employees.



The manufacturer accepts no responsibility whatsoever for the safety, reliability or performance of the radio remote control if repairs or other interventions to the radio remote control have been carried out by non-authorized persons.



Within his organization, the operator must ensure that the equipment is safeguarded against unauthorized handling or manipulation.

8.2 General operating safety guidelines



All legal and operating regulations must be observed before every start-up of the radio remote control.



Operatives must make sure of the proper and safe operating condition of LocControl100 before every start-up. Before starting work or at the change of a shift, it is imperative to

- check the transmitter for any external damage
- check the battery/ies for any external damage
- check the condition of the carrying harness

Before starting work or at the change of a shift, it is imperative to carry out the prescribed safety test, in particular to check the brake and emergency stop functions.



The operative must ensure that the RFID key in the transmitter belongs to the receiver of the locomotive he intends to control.

The receiver identification number of the locomotive to be controlled must be the same as the number engraved on the RFID key.

If this is not the case, or if there is the possibility of a mix-up, the operative must not activate the radio remote control.



If any damage is observed, the transmitter should not be employed.



Before starting work or at the change of a shift, it is imperative to carry out the prescribed safety test, in particular to check the brake and emergency stop functions.



*The LocControl100 must be taken out of service immediately if any functional failings or irregularities are observed.
It is imperative that irregularities are reported to the designated operational office immediately.*

8.3 Safety information for operation



The safety information for operating is given in the “LocControl100 customer-specific operating instructions”, since this can vary according to the system execution.

8.4 Comportment in emergency situations



In case of any malfunction during the course of operation or in all cases where movement of the locomotive or vehicle results in a dangerous situation, the transmitter must be set to safe mode by activating the “Manual stop” switch.



In addition, if the locomotive is at standstill after a manual stop, the transmitter must be switched off by means of the key switch (if available) or by removing the battery.



The operator together with his operating personnel must thoroughly exercise reaction behaviour in emergency situations.



Due to special local conditions or particular applications, situations may arise that were unknown at the time of writing this operating manual. In such cases, special measures relating to safety may be introduced by the operator.

9 Comportment in case of thunderstorms



The usual safety precautions with respect to comportment during thunderstorms must be respected when such storms are approaching. The closeness of the storm should be estimated.

- Do not stand out in the open*
- Do not stand under high masts or trees*
- Do not stand close to open water*

No work should be carried out using the LocControl100 in the centre of storms where there is severe danger of lightning.

This means

- vehicle operation using the radio remote control should be discontinued*
- no mounting or repair work should be carried out on vehicles standing in the open.*

10 Transmitter

10.1 Technical Data - Transmitter

The general technical data and characteristics of the transmitter can be found in the attached LocControl100 data sheet. This data is subject to modification at any time.

Project-specific parameters and transmitter characteristics can be found in the project documentation.

10.2 Carrying harness for the Schweizer Electronic transmitter model



For carrying the transmitter around when working, a carrying harness made of lightweight, weather-resistant plastic material with quick-release fasteners and easily adjustable straps is available in various sizes.

The transmitter is hooked to the two quick-release fasteners.

Thanks to the carrying harness, dropping the remote operating device will be prevented, irrespective of the kind of movement or tilting.

The harness construction is so designed that safe operation of the tilt switch is ensured.



Carrying harness for the Schweizer Electronic radio remote control transmitter

10.3 Use of operator's own carrying harness



The use of an operator's own carrying harness can be dangerous.

If an unsuitable carrying harness is used, the tilt monitoring function could possibly be impaired or even no longer function at all.



If either the LocControl100 purchaser or operator intends to use a different carrying harness to the standard one delivered by the Schweizer Electronic Group, the purchaser and/or operator is obliged, without being asked, to have written approval for the carrying harness from the Schweizer Electronic Group.

Schweizer Electronic will give approval for the proposed carrying harness in writing. Verbal approval will not be valid.

If, according to the assessment of Schweizer Electronic, the carrying harness is not perfectly safe technically or not fit for purpose, Schweizer Electronic cannot give its approval.




If the purchaser or the operator uses a carrying harness that has not been approved by the Schweizer Electronic Group in writing, then all claims under the guarantee as well as claims for compensation against the Schweizer Electronic Group lapse.

10.4 Transmitter operation with transmitter holder


If the transmitter should be operated with a transmitter holder, operation is described in the relevant customer-specific operating manual.

11 Lithium-ion batteries


11.1 Care when dealing with lithium-ion batteries (AkkuPacs)

	<p>ATTENTION: In order to avoid any danger of fire or explosion with lithium-ion batteries, please observe the following warning:</p> <ul style="list-style-type: none">Do not dismantle, make holes in, or short-circuit batteries.Do not throw batteries into a fire or water. Do not expose batteries to temperatures above 60°C.Batteries should only be charged using the charging device provided.
---	--

11.2 Battery expiry date

	<p>Lithium-ion batteries are subject to aging. An expiry date is shown on the battery. Batteries should not be used after this expiry date even if they are judged to be still usable.</p>
---	--

11.3 Disposal of batteries

	<p>Lithium-ion batteries should be appropriately disposed of according to applicable local guidelines.</p> <p>If the operator is not in a position to dispose of batteries in a proper manner, he must return them to Schweizer Electronic at his own cost.</p>
---	---

12 Receiver

12.1 Technical Data - Receiver

The general technical data and characteristics of the receiver can be found in the attached LocControl100 data sheet.

This data is subject to modification at any time.

Project-specific parameters and receiver characteristics can be found in the project documentation.

13 Receiver antenna

The following antenna types are available for use with the receiver:

Article number	Frequency band	Antenna gain
VWE1766	410 – 470 MHz	0 dB
VWE1620	410 – 430 MHz	2 dB
VWE1768	450 – 470 MHz	2 dB

For antennas up to 2dBi the minimum distance to a human body is 20cm.

For antennas up to 6dBi the minimum distance to a human body is 31cm.



ATTENTION: Antennas with more than 6dBi are not allowed to be used.

14 Mounting the receiver, transmitter holder and antenna



The mounting of LocControl100 components, such as the transmitter holder, receiver, signal feeder to the receiver, antenna and the antenna cable between the antenna and the receiver should only be carried out by a qualified specialist who has completed training with Schweizer Electronic and is consequently in possession of a certificate.



All the necessary documentation and instructions for installation will be given to participants in writing during training.

15 Malfunctions

15.1 Transmitter malfunctions

The descriptions of transmitter malfunctions and possible measures for resolving them are listed in the customer-specific manuals, since these may differ according to the system execution.





15.2 Receiver malfunctions

The descriptions of receiver malfunctions and possible measures for resolving them are listed in the customer-specific manuals, since these may differ according to the system execution.

15.3 Battery charger malfunctions

The descriptions of battery charger malfunctions and possible measures for resolving them are listed in the battery charger operating manual.

15.4 Radio malfunctions by external influences

	In difficult terrain without visual contact or in an environment with industrial buildings having reflecting sheet-metal walls, radio traffic can be hampered. This can lead to a reduced radio remote control range. Measures should be clarified on site.
	Rotating lights and other sliding-contact or electric motor with commutator on the locomotive can lead to radio channel disturbances. These disturbances appear in part initially with ageing of the electric motor with commutator or contacts. As a result, this can lead to a reduction of the radio range.
	If several locomotives are working in the same radio space at the same frequency and time slot process with radio remote controls from several manufacturers, radio interference can occur if the radio remote controls are not identically parameterized. In such cases, please contact the relevant maintenance centre.
	If a locomotive is working with a radio module in the toll-free ISM band, it is possible that radio traffic can occasionally be disturbed by other radio devices, such as crane operating equipment.

16 Operating data

16.1 Data acquisition

The LocControl100 memorizes operating data both in the transmitter and in the receiver. Both the transmitter and the receiver have a memory space where 6000 actions can be memorized. This corresponds to approximately 24 hours of operating time.

16.2 Operating data readout

Operating data for the previous 24 hours can be read out via the USB interface on the transmitter and/or receiver, or current operations can be followed online.

In order for the operating data to be read, training as a maintenance engineer 1 for maintenance stage 1 is required.

17 Opening the LocControl100 transmitter and receiver



The **LocControl100** transmitter and receiver should only be opened by authorized personnel.



If the seal fixed to the transmitter or receiver has been broken or damaged, the corresponding system components must immediately be taken out of service. This warning is indicated on the seal.



**Gerät nie selber öffnen! Sichere Funktionsweise ist danach nicht mehr gewährleistet.
Folge: Gefährdung von Personen und Sachen.
Bei Defekt immer zurück an die zugewiesene autorisierte Werkstätte! 0000002**



LocControl100 must always undergo a complete function test after it has been opened. This function test can only be carried out using test equipment designated for that purpose.



Under no circumstances should the installation be put into service without performing this function test after opening the transmitter or receiver.

18 Maintenance of the LocControl100 system

Repair and maintenance work on the radio control should only be carried out by personnel trained and authorized Schweizer Electronic.



Schweizer Electronic offers relevant training. Authorized persons receive written confirmation that they have attended the training courses and are able to carry out maintenance and repair work.



After the transmitter or receiver has been opened for maintenance or repair work, the opened system component must always undergo a full function test.



Every hardware or software exchange, as well as all test reports, must be filed by the implementing office in such a way that it can be traced again at any time. If necessary, Schweizer Electronic must be given access to these documents.

19 LocControl100 safety test every three years

Every **LocControl100** radio remote control must be completely tested **every three years** by Schweizer Electronic. A written request to let the maintenance work to be carried out will be sent. If maintenance work is not carried out according to schedule, all liability claims against Schweizer Electronic are forfeited.

Depending on the customer-specific project, a shorter maintenance interval can be carried out by surveying company TÜV SÜD Rail GmbH or the responsible agency.



Maintenance sticker top: Month
Maintenance sticker bottom: Year

20 Serial number management and traceability

All vital LocControl100 components, such as circuit boards, radio modules, traction/brake switch and software, are serial number managed.

Serial number management allows complete component traceability. In case of a systematic malfunction or an accumulation of failures, Schweizer Electronic can target its search for faulty or vulnerable parts or software and remedy the malfunction.

21 Disposal

It is recommended that you return the device to Schweizer Electronic for disposal.

Should this not be the case, the operator must effect disposal according to current local regulations. He must either hand the device over to a licensed private or public collection company, or dispose of it himself according to the regulations.

Waste materials should be recycled or disposed of in such a way that public health is not endangered and without using processes or methods that may cause damage to the environment.

GUIDELINES EU guidelines 75/442/EWG and 91/156/EWG

SORTING

After dismantling the device, the various components must be sorted into waste categories according to the listings in the European Waste Catalogue (EWC). This catalogue is applicable to all waste materials, regardless of whether they are intended for disposal or recycling.

If the operator is not in a position to dispose of the device corresponding to the applicable guidelines at the time, he must send it to the assigned service point at this own cost. The latter will dispose of the device free of charge.

22 Limited manufacturers guarantee

22.1 Guarantee declaration

The Schweizer Electronic Group ("Schweizer Electronic") provides the original end-customer ("Customer") with the following product guarantee:

The manufacturer guarantees that, for a duration of **twenty-six (26) months** from the date of delivery, material, construction or workmanship defects will either be repaired or faulty products or product parts replaced free of charge, at their own discretion, by Schweizer Electronic or a Schweizer Electronic authorized service workshop within an economically reasonable time.

For parts that are subject to **wear through daily use**, a guarantee period of **eight (8) months** from the delivery date is granted. This guarantee provision is applicable to carrying harnesses, radio device carrying cases, battery cases, external antennas and antenna cables, sealing caps, bellows for driving brake switches and transmitter buckles as well as batteries.

The guarantee period starts from the proven date of delivery according to the delivery note accompanying delivery. The guarantee period will be neither extended nor restarted from the beginning nor be influenced in any other way as a result of the goods being resold. For repaired or exchanged products or parts, the guarantee period is ninety (90) days from the despatch date or until the original guarantee period expires, whichever is the latest. All exchanged products or parts become the property of Schweizer Electronic.

Within the framework of this manufacturer's guarantee, Schweizer Electronic, at seller's option and cost, is exclusively bound to either replace or repair the faulty product or part thereof, or refund the product purchase price. For the repair or exchange of products, Schweizer Electronic may use new, renewed or as-new products or parts.

This manufacturer's guarantee is only valid and enforceable in the country where the product was bought, and also assumes that the product from Schweizer Electronic was destined for sale in that country. If the customer bought the product in a member country of the European Union, Iceland, Norway or Switzerland and if it was originally destined for sale in one of them by Schweizer Electronic, this manufacturer's guarantee is valid and enforceable in all the above-mentioned countries. However, based on country-specific components, there could be certain guarantee service limitations.

22.2 Exclusions from the manufacturer's guarantee

Excluded from the manufacturer's guarantee are defects or alleged defects arising from:

- misuse;
- negligence;
- faulty manipulations;
- inappropriate handling or project planning;
- inadequate maintenance (for instance, if maintenance manuals and instructions are not strictly adhered to);
- disregarding operating and application manuals;
- unauthorized attempts at opening, repairing or modifying;
- excessive overloading or use;
- inappropriate use (not strictly according to the operating manual);
- normal wear and tear;
- use of the product in conjunction with any products, accessories, software and/or services and where Schweizer Electronic ascertains that the product itself is not defective; or
- as a result of an accident, fire or other event that is not reasonably within Schweizer Electronic's sphere of influence.

Any guarantee or liability claim becomes immediately invalid if:

- the product's receiver or transmitter was not installed and put into service by suitably qualified and correspondingly authorized persons who have been trained at Schweizer Electronic certified training courses;

- if, without the prior written agreement of Schweizer Electronic, changes are made to the product with respect to wiring to the technical unit compared to the released project documentation;
- the product is opened or an attempt has been made to open it by someone other than a person from Schweizer Electronic or an authorized service station (independent of whether the opening up was carried out by a qualified and trained person). In all cases, the removal of or damage to the guarantee seal on the product is taken as proof of opening or of an unauthorized attempt to open;
- the repair of a product and of its assembly groups is not proven to have been carried out exclusively by qualified persons having successfully completed the corresponding Schweizer Electronic certified training course;
- the product serial number has been removed, erased, damaged or changed or is in any way illegible;
- the product has not been repaired with approved replacement parts; or
- the product has not been checked and maintained by persons qualified and authorized to carry out the relevant work (prerequisite is the successful completion of the Schweizer Electronic licensed training course) in accordance with the guidelines set out in the product operating manual
- the product was not returned to Schweizer Electronic or a Schweizer Electronic authorized service centre in the original packaging or in reusable packaging specified by Schweizer Electronic

The product contains country-specific components (radio module in country-specific frequencies, etc.). In case of re-exporting the product from the original country of destination to another country, such country-specific components are not valid as faults for the purpose of this guarantee.

22.3 Guarantee claims

Within the guarantee period, the customer must inform Schweizer Electronic or a Schweizer Electronic authorized service centre in writing of any intended claim under the guarantee. In addition, the customer must provide the following:

- a detailed description of the defect and
- the product type and serial number of the defective device(s)
- the exact current location of the defective device(s).

Without prior detailed notification in writing of the intended claim under the guarantee, Schweizer Electronic is not under any obligation.

The defective product must be returned to Schweizer Electronic or to a Schweizer Electronic authorized service centre by the customer at his own cost and risk.

The repaired or replaced product will be returned to the customer within a reasonable time. Schweizer Electronic will assume the shipping costs for repaired or replaced products and, if possible, will choose the same method of transport as the customer used for returning the faulty product. Schweizer Electronic accepts no liability for damages during transport.

Schweizer Electronic will, at its own discretion, determine the place of execution for guarantee work. For products that form part of a fixed installation, the place of execution is the installation location and the customer must compensate Schweizer Electronic for guarantee work if the installation location is not the same as that where the product was originally installed or delivered.

Schweizer Electronic and Schweizer Electronic authorized service stations reserve the right to levy a handling charge if the product is not covered under the conditions of this manufacturer's guarantee.

22.4 Guarantee exclusivity

This limited manufacturer's guarantee comprises the customer's sole and exclusive legal redress against Schweizer Electronic and Schweizer Electronic's sole and exclusive liability for product defects. This manufacturer's guarantee replaces any other Schweizer Electronic guarantee and/or liability for whatever legal reason (contract, quasi-contract or unauthorized handling). As far as legally permissible and without restriction, this includes any implicit conditions, guarantees or other conditions with regard to adequate quality, customary quality, suitability for use or observance of third-party rights, which are all herewith expressly waived.

22.5 Limitation of liability

Provided it is legally permissible, Schweizer Electronic will not be liable for direct, indirect and/or unusual damages, consequential damages, legally awarded punitive damages, loss of business of any kind, loss of information or data, or any other financial losses resulting from the sale, installation, operation, maintenance, use, performance, failure or operations interruption of the product or in connection with it, and, at its own discretion, limits its liability to either a replacement or repair, or reimbursement of the purchase price. This limitation of liability applies even if Schweizer Electronic or its authorized sales or service partner was informed of the possibility of an occurrence of this damage. Schweizer Electronic's liability is limited to the amount of the product's acquisition value.

The foregoing limits of liability are not valid in cases where Schweizer Electronic acts wilfully or with gross negligence, or in the case of death or personal injuries if these are attributable to negligence on the part of Schweizer Electronic.

22.6 Applicable law and court of jurisdiction

This manufacturer's guarantee is subject to Swiss law to the exclusion of the UN Convention on Contracts for the International Sale of Goods of 11 April 1980. The court of law at the recorded place of business of Schweizer Electronic in Reiden, Switzerland, is responsible.

At its own discretion, Schweizer Electronic also reserves the right to appeal to the court of law at the customer's place of business or domicile.

23 Further user information

23.1 FCC Interference Statement, Part 15.105(b)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment of and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

23.2 FCC Part 15.21 Warning

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

23.3 FCC Part 15.19(a) Statement

This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.*

23.4 FCC/ISED RF Exposure Guidance Statement

The following statement is valid for the receiver only / La déclaration suivante n'est valable que pour le récepteur:

In order to comply with FCC/ISED RF Exposure requirements, this device must be installed to provide at least 25 cm separation from the human body at all times for antennas up to 6dBi and 15cm for antennas up to 2dBi. Afin de respecter les exigences de la FCC/ISED concernant l'exposition aux fréquences radio, ce système doit être installé pour assurer une séparation d'au moins 30 cm du corps humain à tout instant pour les antennes 6dBi max et 15cm pour les antennes 2dBi max.