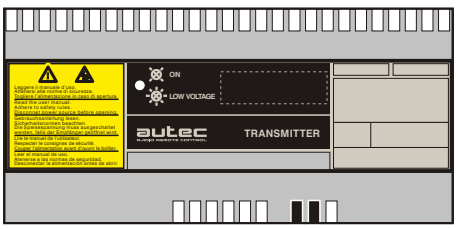
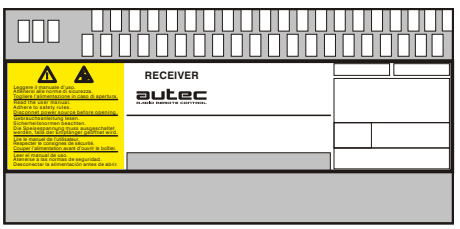
autec
RADIO REMOTE CONTROL

KTC system





SERIES E16

Installation, operation and service manual

autec
RADIO REMOTE CONTROL

KTC system

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SERIES E16

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Follow the indications and warnings given by the machine producer regarding the machine controlled by the radio remote control.

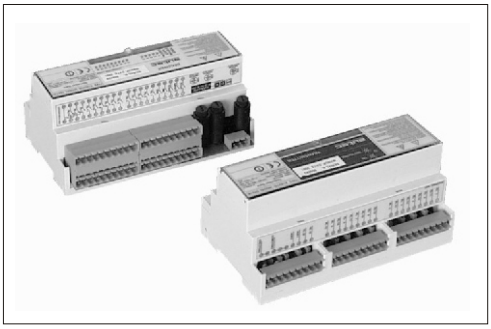
The information contained in this manual considers a representative configuration of the radio remote control: please find radio remote control real configuration in the technical data sheet (attached to the manual).

If this manual is lost or damaged, ask for a copy from AUTEC. Please specify the serial number of the relative radio remote control.

Contact AUTEC if any of the instructions and/or warnings given in this manual are not clear.

The information contained in this manual is subject to modification without notice and is not binding.

KTC SYSTEM
INSTALLATION AND OPERATION MANUAL



This manual is an integral part of the KTC system (KIT for TRANSMISSION of COMMANDS). Our objective is to lay down the basic installation and operational instructions.

BEFORE CARRYING OUT ANY OF THE INSTALLATION AND OPERATIONAL PROCEDURES IT IS ESSENTIAL TO READ AND UNDERSTAND ALL OF THE KIT MANUAL

INDEX

Conventions

Any pieces of text written in **bold** should be read very carefully.

This symbol highlights extremely important indications and information which, if not observed, can create seriously dangerous situations for people or things.

1.1 Conformity

Each KTC radio remote control complies with Part 15 of the 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.

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

1.2 Applications

Autec cannot be held responsible if the radio remote control is installed on applications that are different from those permitted:

PERMITTED APPLICATIONS:

- Telemetry, signal systems
- Transmission of commands for machines which lift and move material
- Transmission of a safety command
WARNING: Follow the instructions carefully on pages 8,9 and 10

FORBIDDEN APPLICATIONS

- Machines installed in environments where equipment with explosion-proof characteristics are being used
- Transmission commands for machines which lift and transport people

1.3 General warnings

WARNING: Connect the POWER SUPPLY to the KTC only by means of a Safety Transformer (or corresponding IEC 60204-32 paragraph).

Permission to install and to use the KTC is to be given exclusively to qualified personnel.

All machines must undergo a risk analysis; therefore it is necessary to evaluate, within the limits of this analysis, if the machine can be radio remote controlled.
The machine producer and/or the person who decides upon radio remote control use and installation is responsible for this analysis.
Autec cannot be held responsible if the risk analysis is not carried out correctly.

To guarantee correct radio remote control operation, all current regulations regarding safety at work and accident prevention should be respected. All current user country national laws regarding the use of both the machine and the radio remote control MUST ALWAYS be respected.
Autec cannot be held responsible if the radio remote control is used in unlawful working conditions.

System must be installed by a licensed technician and in accordance with all relevant local, state/provincial and federal regulations, including but not limited to NEC, OSHA, CE etc.

Autec will not accept any responsibility if the KTC is:
- installed for applications which are not authorised
- used in working conditions which do not conform to the relevant regulations
- is not installed by qualified personnel

If a fault or breakdown occurs in the KTC, do not use the KTC until the problem has been completely resolved.
When damaged parts need to be replaced, qualified personnel or service representative have to carry out this operation using original Autec spare parts.

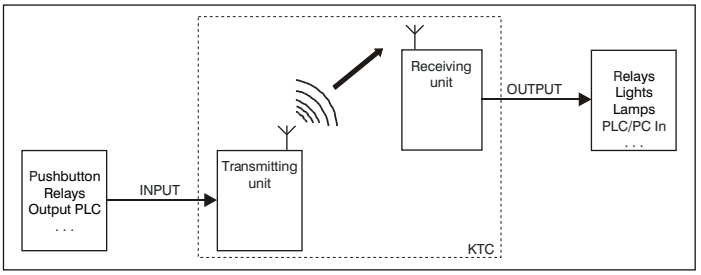
2.1 Operational principle

The KTC system is used to activate commands by remote control (to start up equipment for example) and to turn on signals (i.e.: telemetry …).

The KTC consists in a transmitting unit and a receiving unit.
The transmitting unit communicates with the receiving unit by means of a coded radio message which contains data and address information. The receiving unit can only decode messages sent by the transmitting unit belonging to the same kit (i.e.: with the same address). This ensures that signals or unwanted commands cannot be activated. In the event of: interference; an incorrect or interrupted radio transmission, the receiving unit stops the system autonomously (passive emergency function).

Risk analysis of the equipment or system which uses a KTC , has to take into account that the radio link may be interrupted, due to electromagnetic disturbance or interference. This will cause interruption of the KTC system functionality and will require a new start-up sequence.

KTC operational scheme



The transmitting unit is installed where the commands are activated (INPUT) by means of actuators (pushbutton, relays, output PLC …). The receiving unit is installed where the commands or signals (OUTPUTS) are controlled (relays, lights, lamps etc..).

2.2 Radio frequencies

The KTC is programmed for use at a certain radio frequency.
The frequencies used fall within the band of frequencies established by American regulations at the time the KTC was put onto the market.
The band is 902 -928 MHz.

Should it be necessary to install the KTC near other radio equipment, the radio frequencies used by the two radios must be different (for frequency setting see page 26).

2.3 Documentation

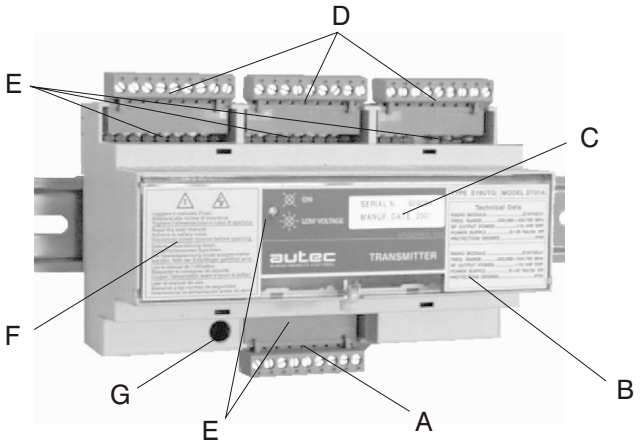
The following minimum documentation is supplied with each radio remote control:
- installation, operation and service manual
- a guarantee certificate
- the radio remote control technical data sheet

Make sure that the following documents have been supplied: if they are not, request them from Autec. Please specify the radio remote control serial number.

Warranty

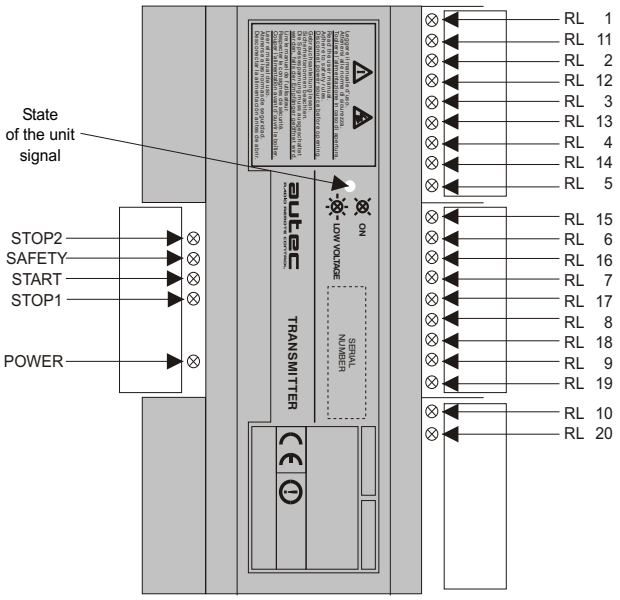
The conditions of warranty applicable to the KTC are specified in the " Warranty Certificate".
The radio remote control identification and approval data is given on plates that are on both the transmitting unit and the receiving unit.
The plates MUST NOT be removed from where they are placed or damaged otherwise the warranty will be forfeited.

2.4 Transmitting unit



A	Power supply terminal block
B	Technical data plate
C	Identification plate
D	Input terminal blocks
E	Light signals
F	Openable cover
G	Antenna connector

Light signals



POWER: indicates that the power supply is present

STOP1 e STOP2: indicates that the STOP circuit is working correctly

SAFETY: indicates that the SAFETY function is on (it must be on if any of the movement commands are operational, when the unit is being used to operate or start up equipment).

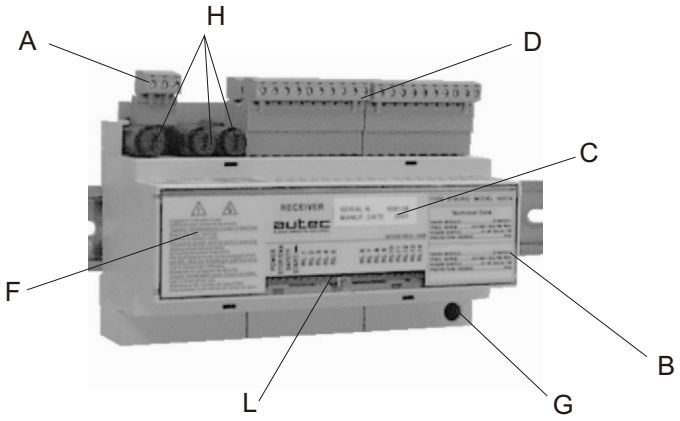
START: indicates that the START function is operational

RL1 - RL20: indicates that the function which corresponds to the command is operational (see KTC technical data sheet)

State of the unit signal: indicates the following operating conditions

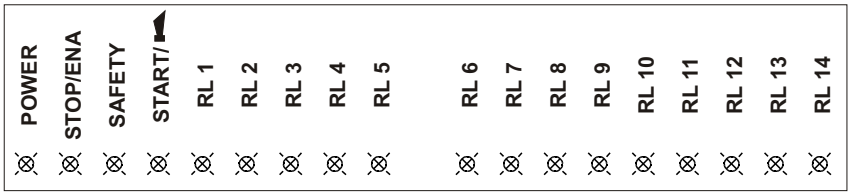
Signal State	Meaning
Off	The transmitting unit is not transmitting
Slow flashing	The transmitting unit is transmitting and the power supply is correct.
Fast flashing	The transmitting unit is transmitting but the power supply is not inside the correct voltage range (after about 3,5 minutes the unit will switch off automatically)
On not flashing	Indicates that there are actuators inserted during start up

2.5 Receiving unit



A	Power supply terminal block
B	Technical data plate
C	Identification plate
D	Output terminal blocks
F	Openable cover
G	Antenna connector
H	Fuses
L	Light signals

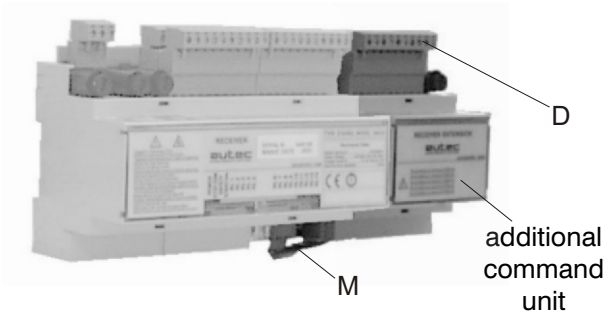
Light signals



POWER: indicates power supply is on
STOP/ENABLE: indicates radio link between the transmitting and the receiving units
SAFETY: Indicates the SAFETY function is activated
START/ : indicates the START function is on
RL1 - RL14: indicates that the relay for the corresponding command is activated (see the KTC technical card)

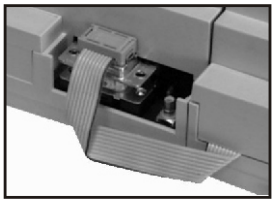
Additional command unit

Six commands may be added to those already incorporated in the receiving unit, by means of an additional command unit.



D	Output terminal blocks
M	Connection cable

To connect the additional command unit to the receiving unit:
- remove the cover on the bottom right (see photo)
- insert the extension connection cable into the connector on the receiving unit (see photo)



3.1 Installation warnings

When installing the KTC follow these instructions carefully:

Always RESPECT all laws and regulations and regulations in force in the country where the installation is carried out.

INSTALL both units either in electrical boards or in casing which guarantees a protection of IP54 or higher (level IP65 is recommended if the cabinet is outdoors).

INSERT, in both units, a switch to open the power supply.

USE a Safety Transformer for the power supply both in the transmitting unit and in the receiving unit (or corresponding IEC 60204-32 paragraph).

DO NOT by-pass the safety circuits in the KTC and/or in the system in which it is installed.

DO NOT MODIFY, TAMPER WITH OR PERFORATE the KTC units.

CHECK the values given in the "Technical Data" to ensure that
- the power supply voltage in the transmitting and receiving units falls within the range specified for each unit.
- the electrical current required for all the circuits controlled by the receiving unit are within the specified range

POSITION both units such that the output terminal blocks be in an upwards direction.

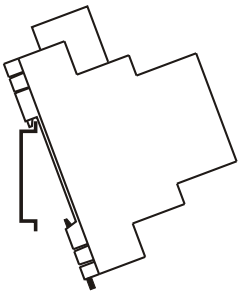
INSTALL both the transmitting and the receiving units far from any components which generate electromagnetic fields and/or heat (for example transformers, power resistors).

CONNECT the GND terminal to the earth (PE), or to the PEN (PE+N=earth+neutral). In the latter case the PEN must always be connected to the mains supply earth.

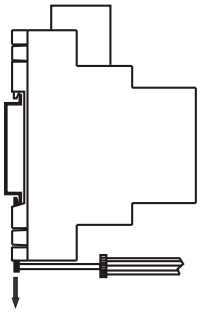
FAILURE TO COMPLY WITH THE ABOVE WARNINGS MAY RESULT IN SERIOUS INJURY OR DEATH TO PERSONNEL AND DAMAGE TO EQUIPMENT.

3.2 Assembly on DIN guide

The transmitting and receiving units must only be installed on DIN EN 60 715 rail (ex DIN EN 50 022).



Hook up the top part of the unit base to the DIN guide.

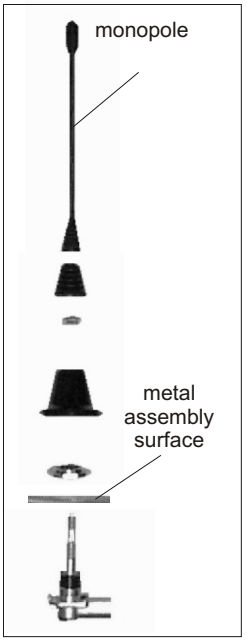


Push using a screwdriver to move the hook at the bottom of the unit down so that the unit fits perfectly into the DIN guide.

Vibrations may interfere with the unit's performance. It is therefore advisable to use anti-vibration systems, when necessary, to reduce the impact of vibrations on the unit.

3.3 Antenna installation

Each of the two units requires an antenna. The antenna is not to be installed on the electrical board.
It is to be installed:
- on a metal assembly surface (clamp, the electrical board ...)
- in such a way as not to be covered by metal structures.



The monopole must not come into contact with metal parts.

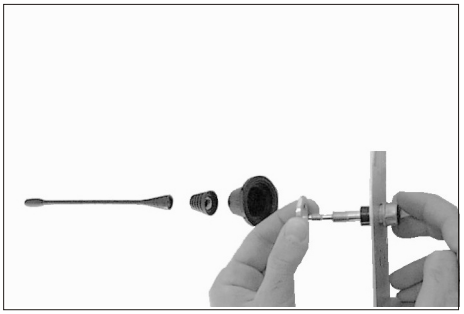
If possible, avoid installing a KTC near antennas of other radio equipment. Otherwise, take the position of the antenna into consideration and install the antennas in such a way as to ensure that both sets work properly (calculate the position, the direction and the distance of the antenna on the basis of use and the working environment).

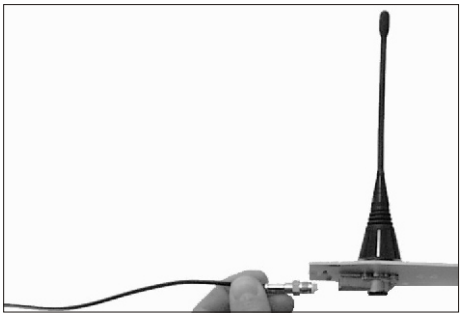
Antenna installation (assembly and disassembly)

Assembly

1
Assemble the parts of the antenna on the metal surface support (for the order see the previous photo).

2
Insert one part of the cable into the connector on the antenna and the other into the antenna connector (G) on the unit.





Disassembly

2
Dismantle the antenna removing it piece by piece from the metal surface support.

1
Disconnect the unit from the power supply. Remove the cable from the connector on the antenna and from the antenna connector (G) on the unit.

3.4 KTC composed by more than one transmitting and/or receiving unit

There are also some KTC configurations defined "multiple" which are composed by more than one transmitting and/or receiving unit. Before using one of these configurations for control a co-ordinate system, it should be considered in the risk analysis the raccomandations which follow.

The address keys which are used in these multiple configurations must NEVER be used on other radio remote controls.

KTC WITH MORE THAN ONE TRANSMITTING UNIT

Risk analysis has to take into consideration the fact that more than one control station can command the equipment (or system) at the same time. In fact,
1) when machines are being commanded (or corresponding IEC 60204-32 paragraph)
2) when the controlled equipment or working site require it,
it is obligatory to:
- use a measures which ensure that only one unit is transmitting at a time
- indicate visually which control station is controlling the receiving unit

KTC WITH MORE THAN ONE RECEIVING UNIT

Risk analysis has to take into consideration the fact that a transmitting unit may command more than one receiving unit at a time. Consequently, it is necessary to take into consideration the possibility that radio interference and noise may interrupt the link with one or more radio controlled receiving units, causing the loss of co-ordinate control behaviour.

3.5 Connection and wiring

To wire up correctly:
- use the terminal block s in the KTC units
- follow the schemes and indications given,
-respect all the regulations regarding electrical panels and relevant national laws..

The person who is carrying out the installation must:
- fill in the attached technical data sheet indicating the wiring and connections to both units
- after wiring and connecting the cable to both units, check that the commands or signals transmitted correspond to those received
- indicate the date on which the KTC was assembled and tested, on the technical data sheet. Sign and stamp this declaration.

In the transmitting unit the actuator contacts wired to the terminals must not be connected to the power supply.

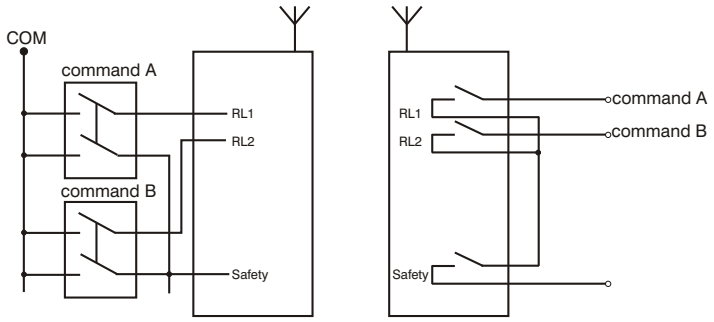
WIRING OF TERMINALS IN THE UNITS

V1 and V2: units power supply	
Transmission unit	Reception unit
Wire directly to the safety transformer. If the use of the equipment requires it, put in a switch to cut out the power supply (e.g. a keyswitch selector)	Wire directly to the safety transformer.

COM and CSZ: Common power supply connection in the transmitting unit	
COM	**CSZ**
Wire the COM to all the commands which may be a source of risk if they are activated when the unit is switched on.	The CSZ has to be wired to all the commands which are not a source of risk if they are activated when the unit is switched on.

START: The KTC start function	
Transmitting unit	Receiving unit
Wire the START terminal to a "COM" terminal. If the use of the equipment requires it, a temporary switch to switch on the KTC must be used (e.g. temporary pushbutton).	Wire up the START terminal only if the transmitting unit has a temporary switch.

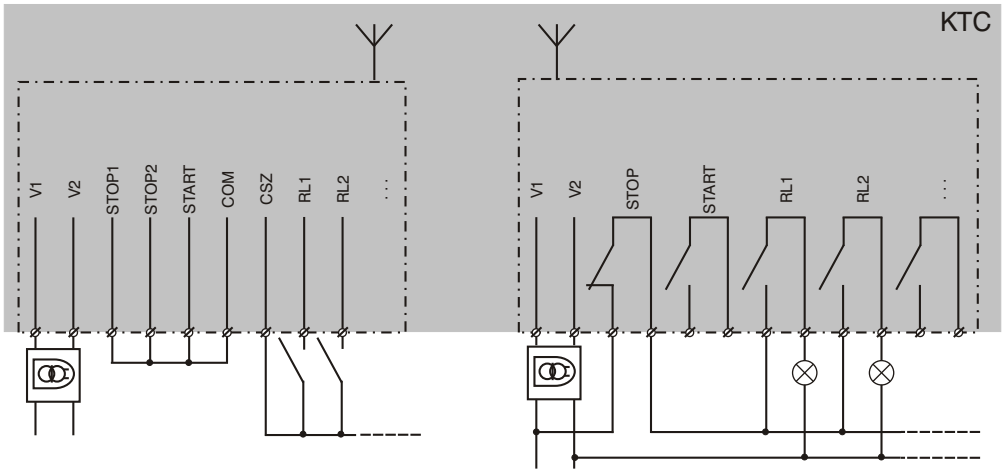
STOP: KTC safety function (when activated the KTC cuts off)	
Transmitting unit	Receiving unit
Wire the terminals STOP1 and STOP2 to one of the "COM" terminals. If the use of the equipment requires it, insert N.C. contacts or safety switch (as specified in EN 418) to activate the function.	Wire up the STOP terminal in series to the common of the commands.

SAFETY. Supplementary control function to protect movement commands	
Transmitting unit	Receiving unit
Wire the SAFETY terminal to a "COM" terminal. If the use of the equipment requires it, activate it at the same time as the commands which need to be protected (e.g.: all the movement commands, as in the following illustration).	Wire the SAFETY terminal to those commands which require protection (the same commands wired up in the transmitting unit). NB: the SAFETY contact opens after a 1 sec. delay
	

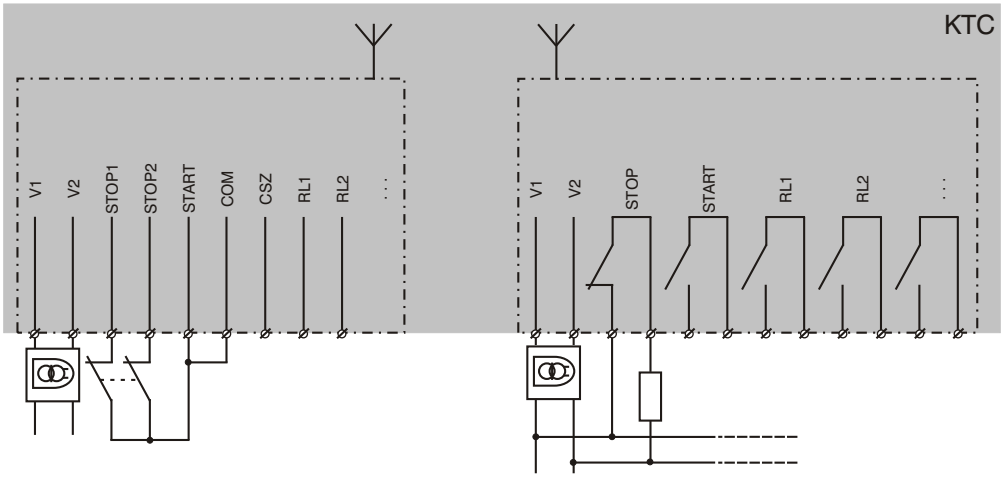
RL1 - RL20: commands	
Transmitting unit	Receiving unit
RL1 - RL6 and RL11 - RL16	
Each of these commands has to be wired up: - to one of the "COM " terminals, in the event that the transmitting unit is not to start if a certain command is on at start up - to the "CSZ" terminal, in the event that the unit can start if a certain command is on at start up.	Each of these commands has to be wired to the appropriate function.
RL7 - RL10 and RL17 - RL20	
Each of these commands can be wired up either to the "COM" or the "CSZ" terminal (if these commands are activated at start up, the transmitting unit turns on).	Each of these commands has to be wired to the appropriate function.

ENABLE	
Transmitting unit	Receiving unit
Not applicable	May be connected when the ENABLE (radio link on) status is required.

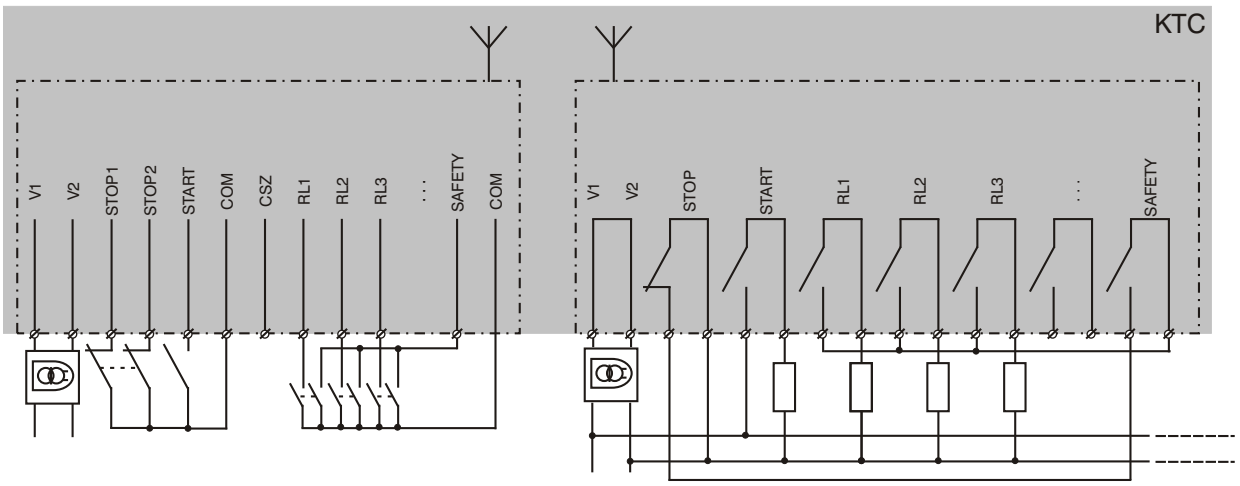
Example of wiring for telemetry working applications



Example of wiring for transmission of a safety command working applications



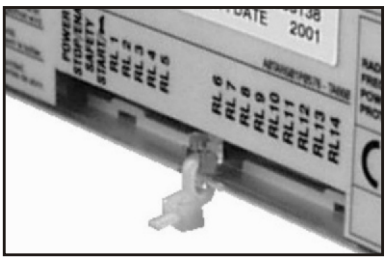
Example of wiring for command transmission working applications (machines which lift and transport material)



4.1 Maintenance warnings

During all ordinary and extraordinary maintenance operations carried out on the KTC and on the system in which it is installed, switch off the power supply to the electrical panel, both in the transmitting and in the receiving unit.

The transmitting and the receiving units should always be completely shut using the appropriate strip.



Any fault should be repaired by authorised Autec personnel (contact Service), using original Autec spare parts only.

All control and maintenance interventions carried out on the radio remote control must be verified and recorded by the person in charge of carrying out maintenance on the machine.

Before carrying out maintenance and/or diagnostics it is recommended to replace the battery with a charged one and ensure the efficiency of the START key.

Routine maintenance in accordance to the instructions given in this manual is fundamental for the safe use of the radio remote control.

Read and strictly respect the warnings given in the battery charger manual in order to lengthen the life of the battery itself.

After each maintenance intervention, always make sure that only the expected manoeuvres are carried out when the relative commands are sent by the transmitting unit.

ROUTINE MAINTENANCE

The following instructions allow to maintain the radio remote control in a perfect condition, guaranteeing it to function safely and correctly for a long period.
Special applications may need more specific routine maintenance interventions to be carried out at different periods.
These instructions do not in any case substitute the norms and laws that regulate work safety, nor do they limit the responsibility of the purchaser and user of the radio remote control.
All given instructions must be followed correctly each time the machine and the radio remote control are started.

If irregularities are noted while carrying out routine maintenance, put the "machine+radio remote control" system out of order, following the indications given (see “Receiving unit diagnostic”)

Transmitting unit

It is recommended **every day** to:
1. remove dust or accumulations of other material from the transmitting unit. Never use solvents or flammable/corrosive materials to clean, and do not use high pressure water cleaners or steam cleaners.
2. store the transmitting unit in clean and dry areas.
3. make sure that the transmitting unit gaskets, joystick bellows, selectors caps and pushbuttons are intact, soft and elastic

4. make sure that the battery seat and the battery contacts are always clean
5. make sure that the transmitting unit are structurally integral
6. make sure that the panel symbols can be easily recognised. If necessary, replace the panel.
7. check identification plate readability and integrity
8. verify the efficiency of the STOP pushbutton before using the radio remote control.

Receiving unit

It is recommended every **three months** to:
1. remove dust or accumulations of other material from the receiving unit. Never use solvents or flammable/corrosive materials to clean, and do not use high pressure water cleaners or steam cleaners.
2. make sure that the receiving unit are structurally integral
3. verify the integrity and connection of the internal wiring to the receiving unit
4. make sue that the panel symbols can be easily seen. If necessary, replace the panel.
5. check identification plate readability and integrity

Electrical operation

It is recommended every **six months** to:
1. make sure that all the relay contacts of the receiving unit operate correctly, controlling contact closing when the corresponding manoeuvre is enabled and contact opening when the manoeuvre is disabled.
2. verify the correct correspondence between the commands that are sent and the manoeuvres that are carried out.
3. verify that the contact for the SAFETY relay is open when no movement command has been sent.

External electric conductors

It is recommended every **twelve months** to:
1. verify integrity along the full length of the cable which connects the receiving unit to the machine.
2. verify the integrity and the electrical connection of the plugs and the connection socket
3. verify and if necessary replace the strips or other fixing systems
4. make sure that the connecting cable has not deteriorated, above all near the cable holder

SPECIAL MAINTENANCE

Any fault should be repaired by authorised Autec personnel (contact Service), using original Autec spare parts only.

AUTHORIZED SERVICE CENTER

When it is necessary to carry out special maintenance (radio remote control repair and replacement of damaged or faulty parts), do not contact anyone other than our Authorized Service Center. In order to make the intervention faster and more reliable, please help us identify the radio remote control correctly and completely by giving:
- the serial number
- the purchase date (given on the guarantee)
- description of the problem found
- the address and telephone number of the place where the radio remote control is being used
- the name of the person to be contacted
- the name of the company that supplied the radio remote control.

Before speaking with a service technician, it is advisable to make sure that the given instructions have been followed correctly.

DISPOSAL

When scrapping, entrust the radio remote control to the separate scrap collecting services in the country of use.
Please pay particular attention when recycling the batteries, applying local rules. Do not throw them away with domestic trash

5 Technical Data

General

Frequency range	902 - 928 MHz
Programmable radio channel	32
Hamming distance	8
Probability of non-recognition of error	< 10 exp-11
Typical working range	100 m
Working temperature	-4°F - +158°F
Time of reply to commands	< 100 ms
Time of reply to STOP	< 100 ms
Passive emergency time	1 second; (opt 0,35 second)
Number of avaible commands	14+start+stop (+6 opt)

Transmitting unit

Power supply	9 - 30 Vac/dc (3W)
Antenna	external with 2,5 metres long cable
Output power	meets FCC Part 15 for license-free operation
Time of switching off warning (caused by insufficient power supply)	ca 3,5 min
Housing	NORIL ®
Minimum protection grade	IP20
Weight	400 g

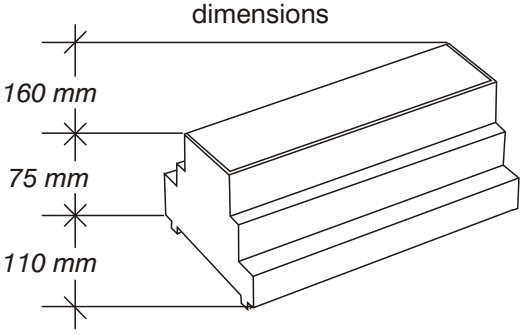
Receiving unit

Power supply	10 - 30 Vac/dc (7W)
Antenna	external with 2,5 metres long cable
Max switching capacity of STOP contacts	4A T (250 Vac)
Max switching capacity of SAFETY contacts	4A T (250 Vac)
Max switching capacity of command contacts	4A T (250 Vac)
Housing	NORIL ®
Minimum protection grade	IP20
Weight	500 g

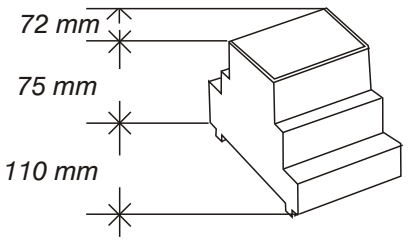
Additional command unit

Max switching capacity of SAFETY contacts	4A T (250 Vac)
Max switching capacity of command contacts	4A T (250 Vac)
Housing	NORIL ®
Minimum protection grade	IP20
Weight	200 g

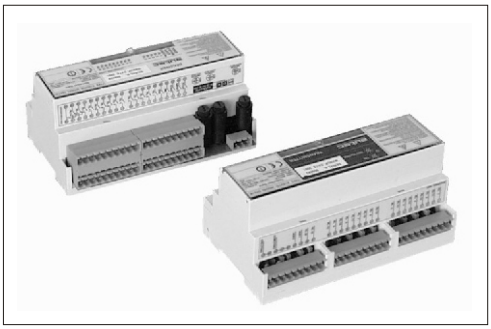
Transmitting/receiving unit dimensions



Additional command unit dimensions



KTC SYSTEM
SERVICE MANUAL



This manual is an integral part of the KTC system and aims to provide the main information required to substitute and programme the relevant parts.

IT IS ESSENTIAL THAT YOU READ AND UNDERSTAND ALL OF THE MANUAL BEFORE YOU REPLACE OR PROGRAMME ANY PARTS OF THE KTC.
It is also advisable to read and understand the "Installation and operation Manual".

INDEX

Conventions

Any pieces of text written in **bold** should be read very carefully.

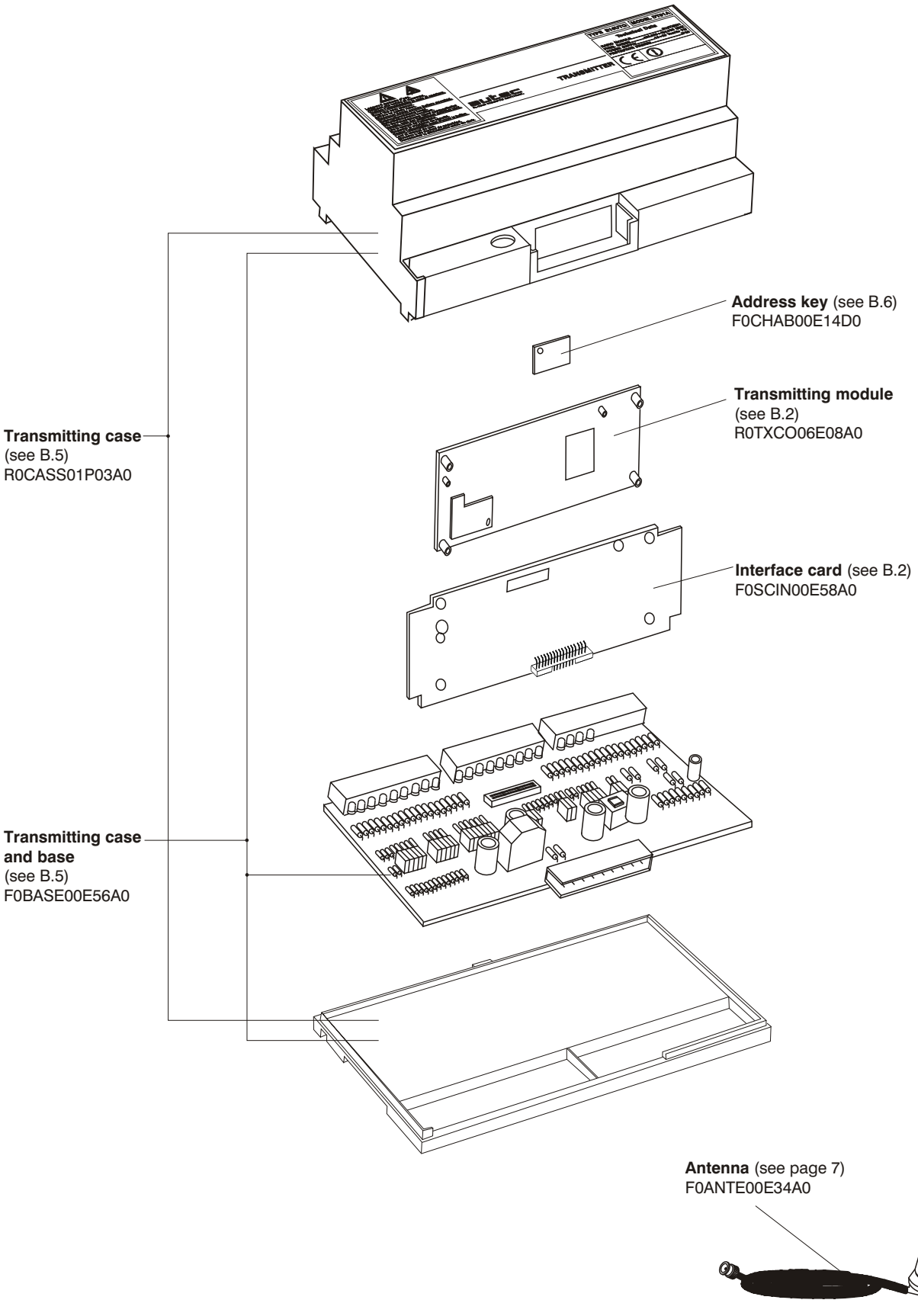
This symbol highlights extremely important indications and information which, if not observed, can create seriously dangerous situations for people or things.

Substitution and programming of KTC parts should be carried out exclusively by qualified personnel.

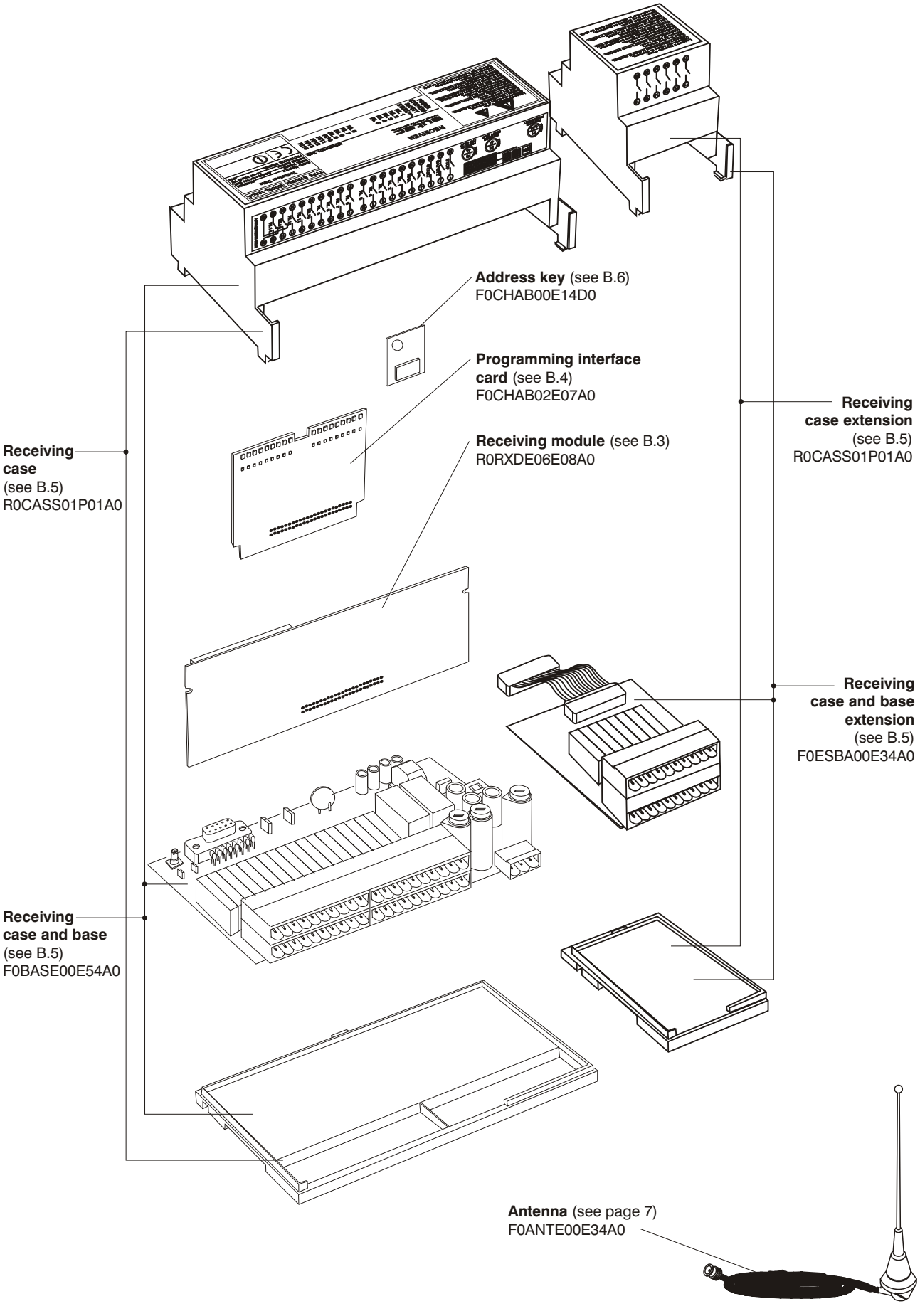
Carefully read the instructions and warnings about the system or the equipment in which the KTC is installed.

A.1 Exploded view of the unit and spare parts

Exploded view of the transmitting unit

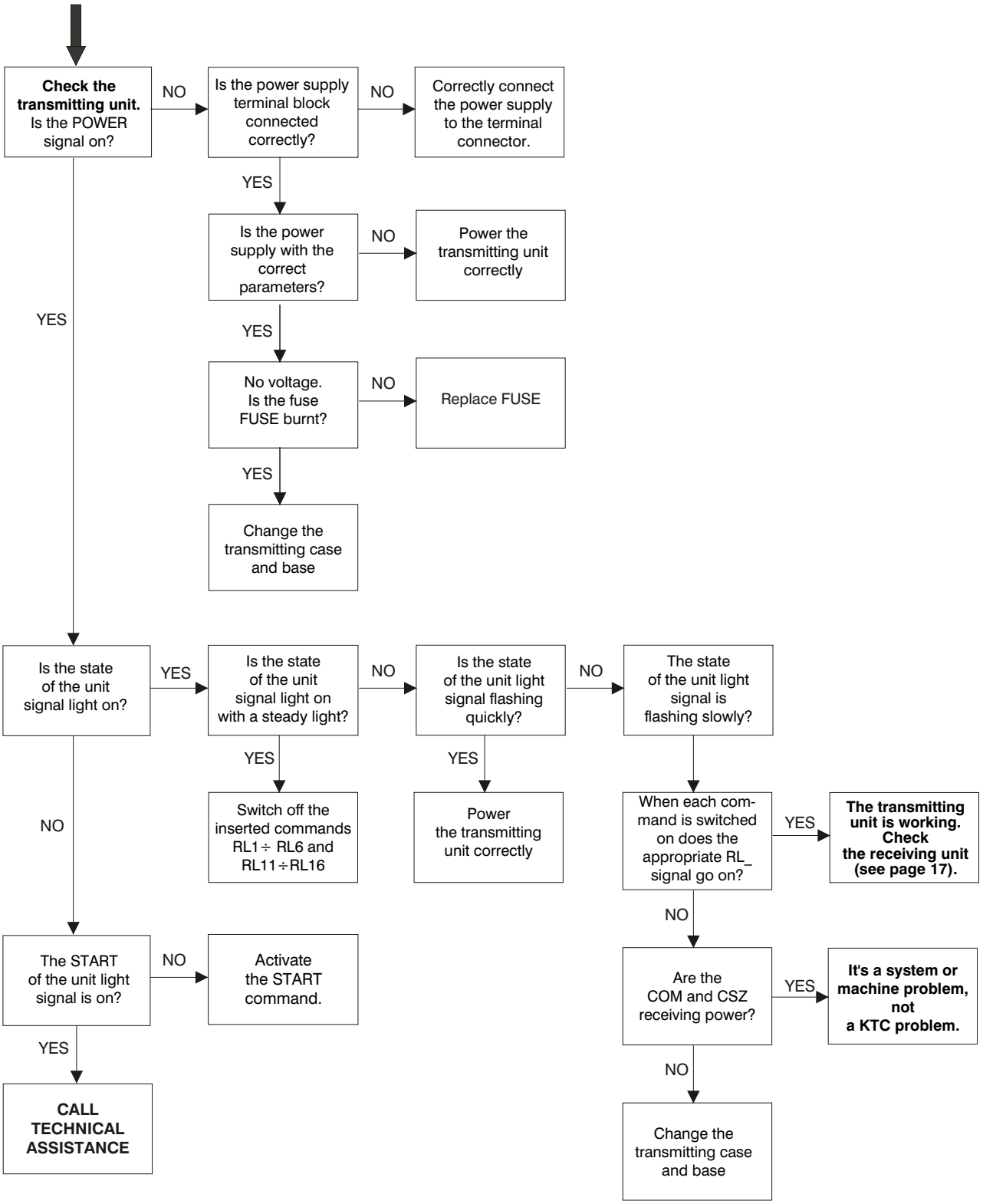


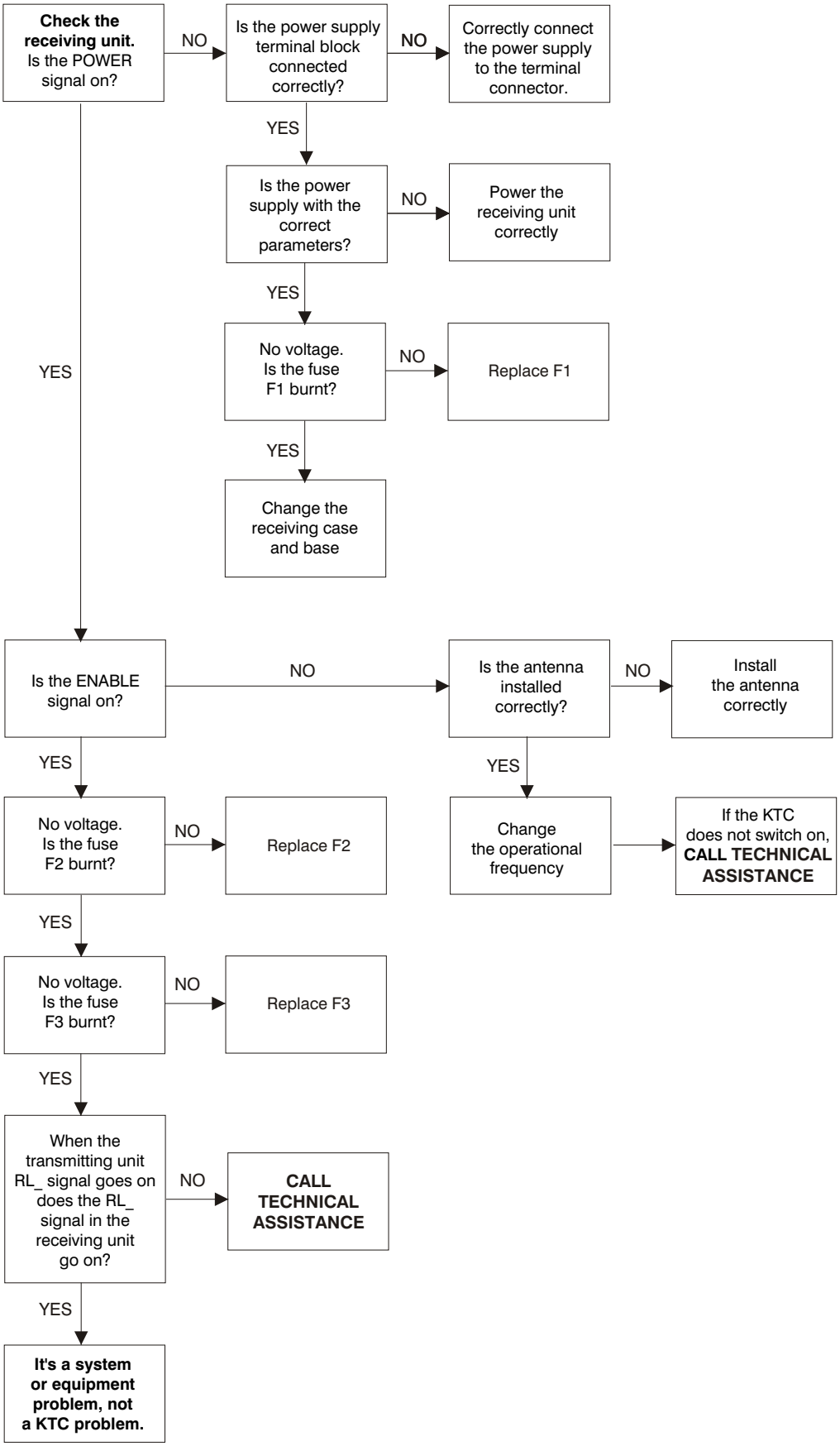
Exploded view of the receiving unit



A.2 Diagnostic flow chart

In the event that the system or the machine activated by the Kit Transmission Commands doesn't function properly carry out the following procedure:

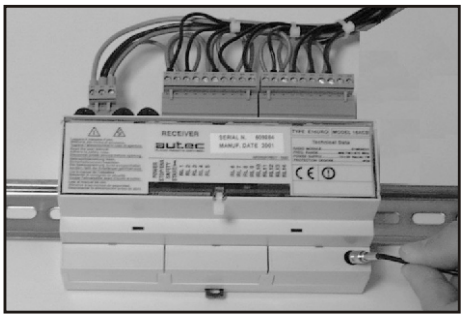



Check the receiving unit. Is the POWER signal on?
NO
Is the power supply terminal block connected correctly?
NO
Correctly connect the power supply to the terminal connector.
YES
Is the power supply with the correct parameters?
NO
Power the receiving unit correctly
YES
No voltage. Is the fuse F1 burnt?
NO
Replace F1
YES
Change the receiving case and base
YES
Is the ENABLE signal on?
NO
Is the antenna installed correctly?
NO
Install the antenna correctly
YES
YES
No voltage. Is the fuse F2 burnt?
NO
Replace F2
Change the operational frequency
If the KTC does not switch on, CALL TECHNICAL ASSISTANCE
YES
No voltage. Is the fuse F3 burnt?
NO
Replace F3
YES
When the transmitting unit RL_ signal goes on does the RL_ signal in the receiving unit go on?
NO
CALL TECHNICAL ASSISTANCE
YES
It's a system or equipment problem, not a KTC problem.

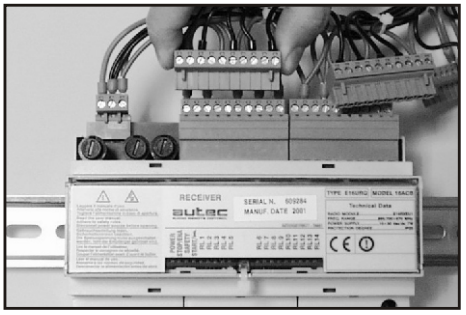
B.1 Opening and closing the unit

Opening

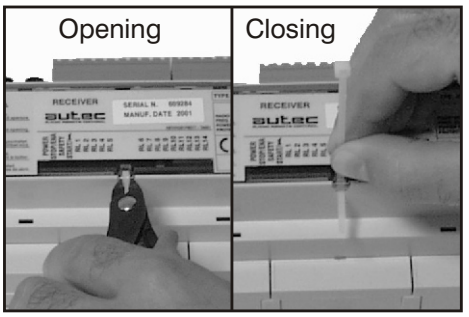
Remove the antenna cable from the connector.



Remove the cable and power connectors.



Cut the strip which locks the unit with pliers.



Open the cover and carry out the necessary operations.

Closing

Close the cover.

Lock the cover by inserting a strip in the hole provided.

Insert the power and cable connectors

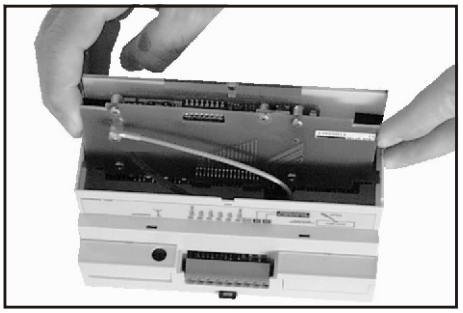
Insert the antenna cable in the connector.

B.2 Replacement of the transmitting module and/ or interface card

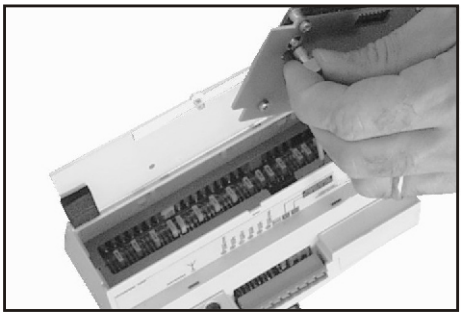
Disassembly

Carry out the opening described in procedure B.1.

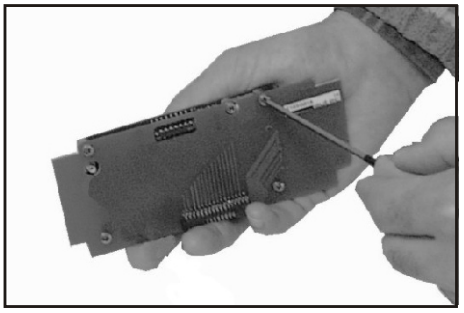
Extract the transmitting module - interface card sandwich.



Extract the antenna cable from the transmitting module.



Unscrew the four screws and separate the transmitting module from the interface card.



Replace the transmitting module and/or the interface card.
If you replace the transmitting module you have to:
- remove the address key from the module to be substituted and put it in the new one (see procedure B.6)
- programme the dip switches of the new module in the same way as those on the old model.

Assembly

Put the transmitting module and the interface card together and tighten the four screws.

Insert the antenna cable in the transmitting module.

Insert the transmitting module interface card in the appropriate fissure so that it fits correctly into the connector.

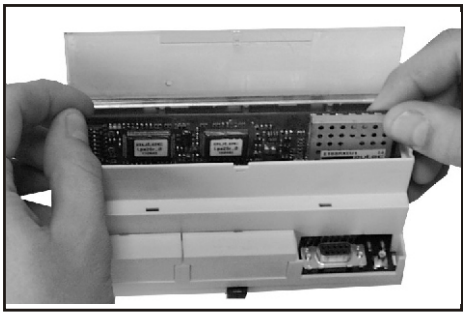
Carry out the closure described in procedure B.1.

B.3 Replacement of the receiving module

Disassembly

Carry out the opening described in procedure B.1.

Extract the receiving module from the receiving unit.



Replace the receiving module.
If you replace the transmitting module you have to:
- remove the address key from the module to be substituted and put it in the new one (see procedure B.6)
- programme the dip switches of the new module in the same way as those on the old model.

Assembly

Put the receiving module in the appropriate fissure so that it fits correctly into the connector.

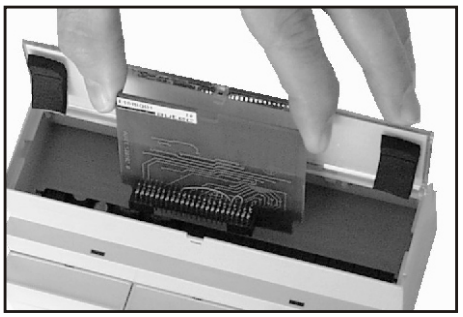
Carry out the closure described in procedure B.1.

B.4 Replacement of the programming interface card

Disassembly

Carry out the disassembly described in procedure B.3.

Remove the programming interface card from the receiving unit and substitute it.



Assembly

Put the programming interface card in the appropriate fissure so that it fits correctly into the connector.

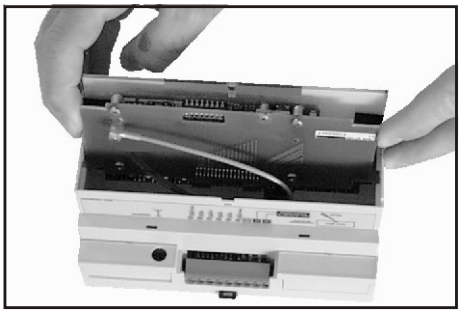
Follow the assembly instructions in procedure B.3

B.5 Replacement of the case or/and base

Disassembly

Carry out the opening described in procedure B.1.

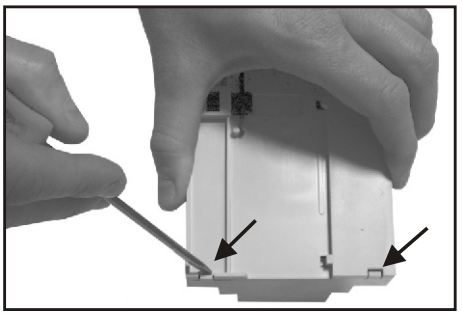
Remove the module and the card from the unit to be replaced (see relevant replacement).



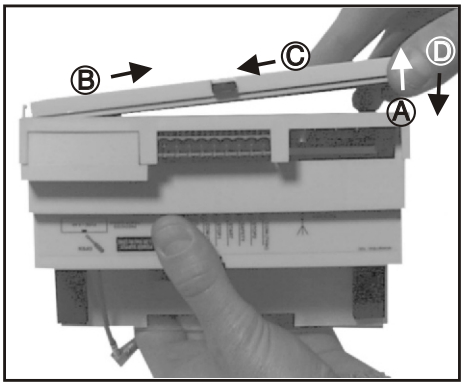
Replacement of the case and base

Replacement of the only case

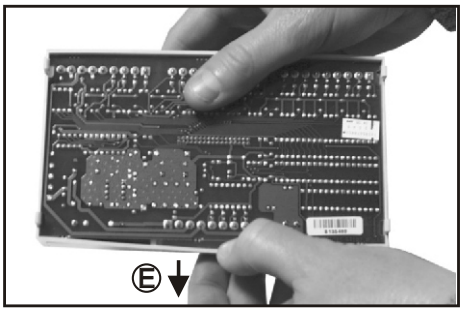
With the help of a screwdriver move the two catches on the bottom of the case, as shown in the figure.



Raise (A) and remove (B) the case bottom, starting from the side from which the catches have been moved.



Extract the base, widening the lower edge (E) slightly.



Assembly

Carry out the closure described in procedure B.1.

Insert the modules and cards removed from the old unit, in the replacement unit.

Reposition (C) first one side of the case bottom, then lightly push the other side (D) into its correct position.

Insert the base firstly into the upper and then into the lower part, slightly widening the lower edge (E) in order to pass the connector.

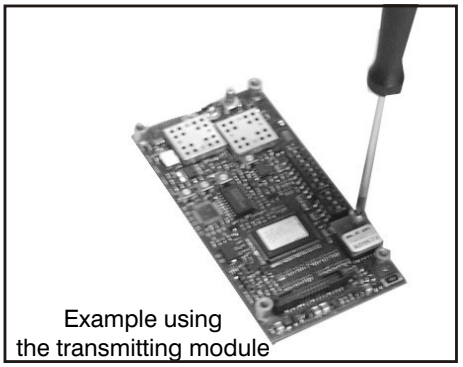
B.6 Replacement of the address key

IN THE EVENT THAT ONE ADDRESS KEY DOES NOT FUNCTION, BOTH HAVE TO BE REPLACED (ONE IS TO BE FOUND ON THE TRANSMITTING MODULE AND ONE ON THE RECEIVING MODULE)

Disassembly

Carry out the disassembly described in the procedures B.2 and B.3.

Unscrew the screws and remove both the address keys from the modules.



Example using the transmitting module

Assembly

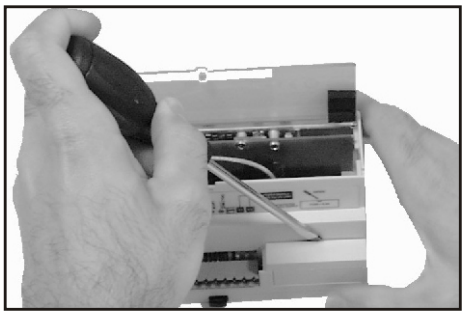
Carry out the assembly described in procedures B.2 and B.3.

Place the address keys in the appropriate modules fix the screws.

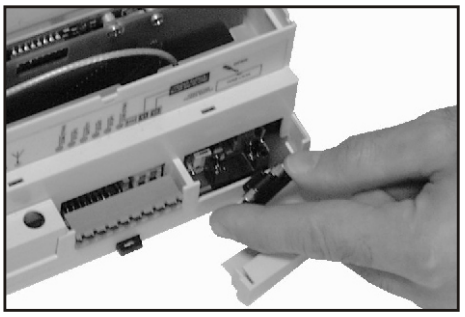
B.7 Replacement of the transmitting unit fuse

Disassembly

After removing the cable connectors, use a screwdriver to remove the cover to the bottom right of the transmitting unit.



Remove the fuse.



The replacement fuse has to have the indicated technical characteristics:

Assembly

Close the cover to the bottom right and insert the cable connectors.

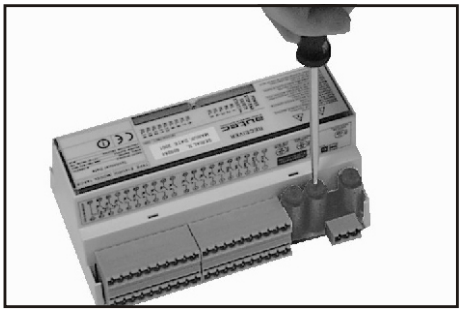
Put in a new fuse.

Fuse	Function	Technical characteristics
FUSE	POWER SUPPLY	0.4A T 250V 5x20 mm

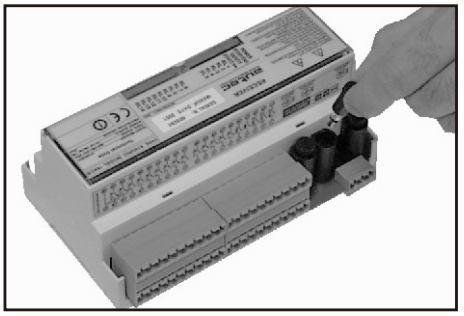
B.8 Replacement of the receiving unit fuses

Disassembly

After removing the cable connectors, push the fuse to be replaced with a screwdriver and turn it in the indicated direction.



Remove the fuse.



The replacement fuse has to have the technical characteristics indicated in the following table:

Assembly

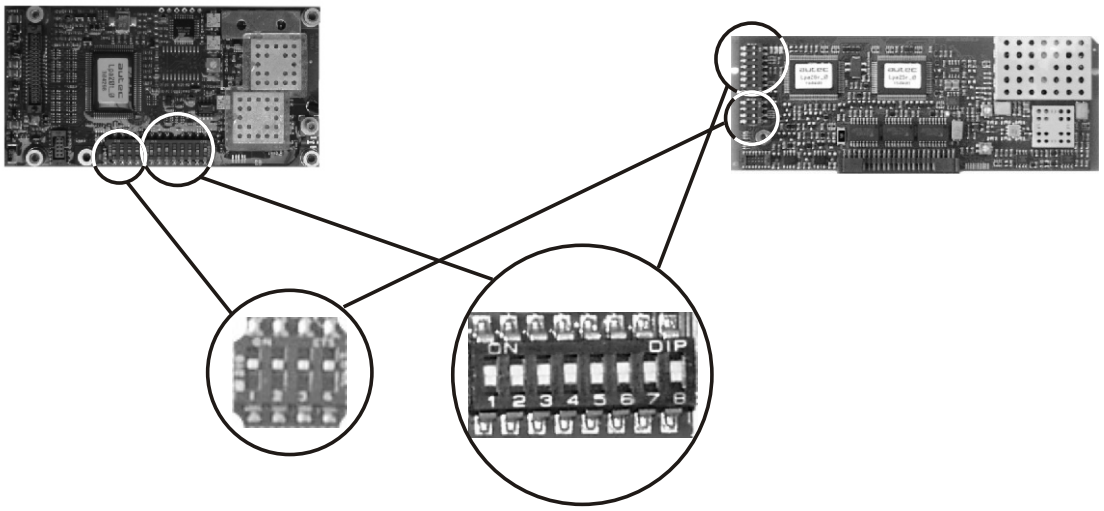
Push the fuse rolling it in the opposite direction to that indicated. Insert the cable connectors.

Put in a new fuse.

Fuse	Function	Technical characteristics
F1	POWER SUPPLY	1A T 250V 5x20 mm
F2	SAFETY	4A T 250V 5x20 mm
F3	STOP	4A T 250V 5x20 mm
F4	SAFETY	4A T 250V 5x20 mm

C Programming

There are eight dip switches for programming in the transmitting and receiving modules.
Operational functions and working frequencies may be programmed.
The group of eight dip switches found in the module is necessary for programming some operations (see C.1)and setting the operating frequency (see C.2).
The other group of four dip switches must be set as indicated in C.1.



Group of 4
dip switches

Group of 8
dip switches

The dip switches must be programmed by qualified personnel. During these operations the unit which is being used must not be connected to the power supply.

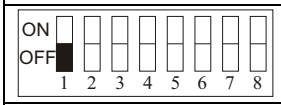
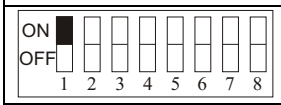
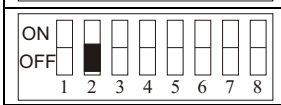
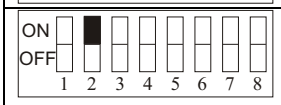
Before programming the dip switch remove:
- the transmitting module- interface card sandwich in the transmitting unit (see procedure B.2)
-the receiving module in the receiving unit (see procedure B. 3)

The group of 8 dip switches present in the radio module of the transmitting unit must be set in the same manner as the group of 8 dip switches (excluding DIP 1) present in the radio module of the receiving unit, when any kind of programming is carried out.

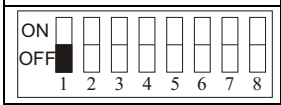
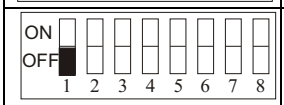
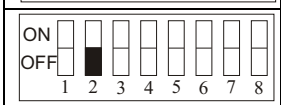
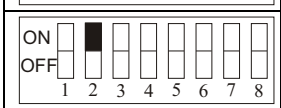
C.1 Programming functions

The dip switches 1 and 2 programme the same functions in 433 MHZ and in 870 MHZ modules.

Group of 8 dip switches in the transmitting module E16STXEU_

DIP SWITCH	Functional description
	**Dip switch 1** OFF enables the automatic off switch: if the transmitting unit is on but none of the commands is operational, after about 3,5 minutes the unit switches itself off automatically.
	**Dip switch 1** ON disables the automatic switch off function: if the transmitting unit is on but no commands are activated for about 3,5 minutes, automatic switch off does not occur.
	**Dip switch 2** OFF activates the insufficient power acoustic signal. When the power supply to the transmitting unit goes below a certain value, the relay in the receiving unit is activated.
	**Dip switch** 2 ON switches off the insufficient power acoustic signal.

Group of 8 dip switches in the receiving module E16SRXEU_

DIP SWITCH	Functional Description
	**Dip switch 1** in the ON position fixes passive emergency* at 1 second.
	**Dip switch 1** in the ON position fixes passive emergency* at 0.35 seconds. **
	**Dip switch 2** OFF activates the insufficient power acoustic signal. When the power supply to the transmitting unit goes below a certain value, the relay in the receiving unit is activated.
	**Dip switch** 2 ON switches off the insufficient power acoustic signal.

* passive emergency: the receiving unit decides autonomously to switch the system off when the radio signal is incorrect, interrupted or there is interference

**** Following from the status of dip switch no.1 or possibly due to a failure (of the dip switch itself), a delay up to max 1 second may occasionally occur between command release and actual deactivation of outputs. This is due to the characteristics of radio propagation (i.e.: EM interferences, near out-of-range condition). Care must be taken to ensure that this could never lead to.**

Group of 4 dip switches in the transmitting module E16STXEU_

DIP SWITCH


Group of 4 dip switches in the receiving module E16SRXEU_

DIP SWITCH


C.2 Programming the operational frequency

A kit Transmission Commands has two operational modes:
- manual frequency (programming with DIP8=ON)
- automatic scan (programming with DIP 3- DIP 8= OFF).

AUTEC PROGRAMMES THE OPERATIONAL MODE TO MANUAL FREQUENCY.

MANUAL SELECTION: DIP 8 = ON

In this mode the working frequency can be set using the dip switches set out in the tables below.

In this mode the dip switches numbered from 3 to 8 in the transmitting module must be in the same position as the dip switch in the receiving module.

MHz	DIP SWITCH 3	4	5	6	7	8	MHz	DIP SWITCH 3	4	5	6	7	8
902.150	OFF	OFF	OFF	OFF	OFF	ON	915.350	ON	OFF	OFF	OFF	OFF	ON
903.050	OFF	OFF	OFF	ON	OFF	ON	916.250	ON	OFF	OFF	ON	OFF	ON
903.850	OFF	OFF	OFF	OFF	ON	ON	917.050	ON	OFF	OFF	OFF	ON	ON
904.650	OFF	OFF	OFF	ON	ON	ON	917.850	ON	OFF	OFF	ON	ON	ON
905.525	OFF	ON	OFF	OFF	OFF	ON	918.675	ON	ON	OFF	OFF	OFF	ON
906.325	OFF	ON	OFF	ON	OFF	ON	919.525	ON	ON	OFF	ON	OFF	ON
907.175	OFF	ON	OFF	OFF	ON	ON	920.375	ON	ON	OFF	OFF	ON	ON
907.975	OFF	ON	OFF	ON	ON	ON	921.175	ON	ON	OFF	ON	ON	ON
908.850	OFF	OFF	ON	OFF	OFF	ON	922.050	ON	OFF	ON	OFF	OFF	ON
909.650	OFF	OFF	ON	ON	OFF	ON	922.850	ON	OFF	ON	ON	OFF	ON
910.450	OFF	OFF	ON	OFF	ON	ON	923.650	ON	OFF	ON	OFF	ON	ON
911.250	OFF	OFF	ON	ON	ON	ON	924.450	ON	OFF	ON	ON	ON	ON
912.125	OFF	ON	ON	OFF	OFF	ON	925.325	ON	ON	ON	OFF	OFF	ON
912.925	OFF	ON	ON	ON	OFF	ON	926.175	ON	ON	ON	ON	OFF	ON
913.775	OFF	ON	ON	OFF	ON	ON	926.925	ON	ON	ON	OFF	ON	ON
914.525	OFF	ON	ON	ON	ON	ON	927.725	ON	ON	ON	ON	ON	ON

Table for programming radio modules

AUTOMATIC SCAN: DIP 3 - DIP 8 = OFF

In this mode the receiving unit automatically looks for the operational frequency of the transmitting unit. The automatic scanning and the choice of the available frequencies, have been studied so as to avoid interference from other systems as much as possible.
When interference interrupts normal functioning of the equipment, transfer to another frequency may be obtained by means of the following procedure:
1. Start the transmitting unit
2. Activate the START command
3. Activate the STOP command
4. Deactivate the START command
5. Deactivate the STOP command
5. Activate the START command (it may take a few seconds before the radio link comes back: so maintain the START for 8 - 10 seconds.

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