User Manual

Transmitter *PG10 -IR*

Receiver *AC16-IR*

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UBIR-PG10-16

TABLE OF CONTENTS

1. USER MANUAL

Please read this manual before operating the Remote Control.
For ease of reference, symbols have been placed at the side of paragraph titles to highlight the importance of the information contained in the paragraph.

IMPORTANT!
To learn how to operate your radio remote control: operating instructions for radio remote control.

To become familiar with your radio remote control: radio remote control technical data.

To become thoroughly familiar with your radio remote control: detailed information on radio remote control.

Bold text is used to draw attention to text that you should read carefully.

This manual has been drawn up by qualified FSL Electronics personnel.

The contents of this manual are subject to change without prior notice, therefore the operator is required to verify (before using the remote control) that the information contained in this publication are consistent with the device they have in their possession.

Further information on the operation of the radio remote control system, particularly if made on the customer's particular specifications, can be found in the documents annexed to the manual that should be considered as an integral part of the manual.

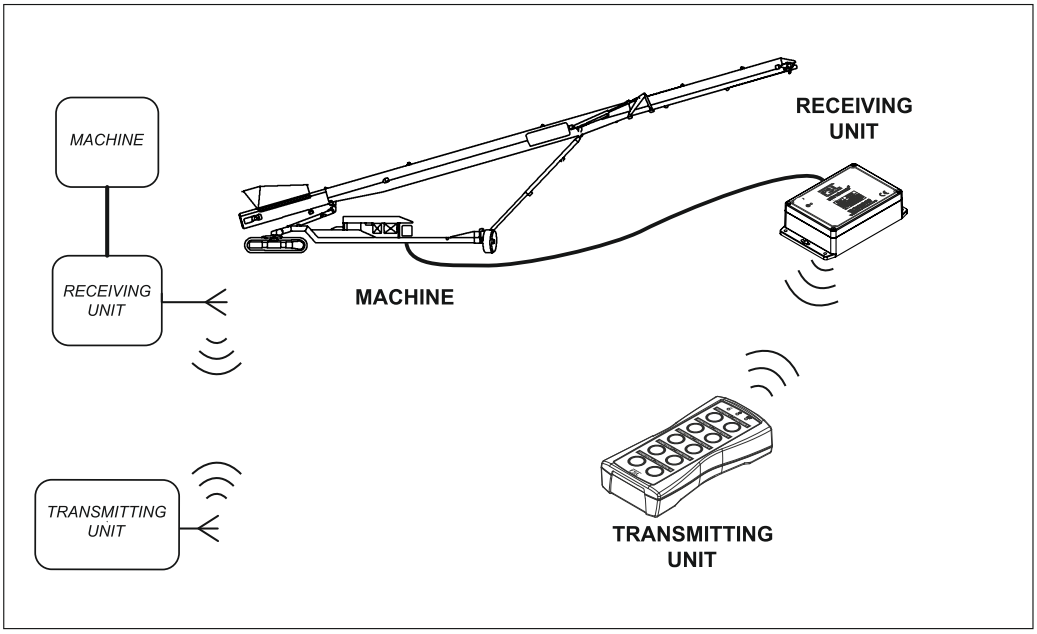
Please Contact FSL Electronics in the event there are instructions, warnings or indications which may prove to be unclear.

The information provided by FSL Electronics in this manual are regarded as accurate and reliable; however, the company can not be held responsible for omissions or errors.

This updated edition incorporates suggestions from our Customers to provide an effective tool supporting you in your day-to-day work.

2. USAGE INSTRUCTIONS

2.1 GENERAL INFORMATION



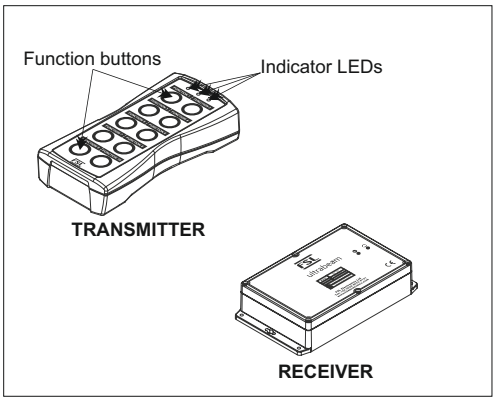
General block diagram

The UBIR range from FSL Electronics is a family of industrial remote controls that can be used for the control of lifting, transportation and general equipment on machines where specific non safety features are required for the operation.
The UBIR type remote control system is composed of two main parts:
1. The transmitting Unit (TPG10-IR).
2. The Receiving Unit (AC16-IR).
The system, which uses a unique protocol to transport the control signals, enables the operator to move around the machine giving the possibility to position themselves where it is possible to better control its movements and to choose a safer operating position in total freedom.
The remote control is designed in order to be used when an interference-free frequency is activated so as not to disturb other devices in the vicinity and vice versa not be disturbed.
Any command transmitted contains a unique code that can not be changed, which makes the activation of manoeuvres by different transmitters of any brand or model impossible.

2.2 APPLICATIONS AND USE CONDITIONS NOT PERMITTED

This remote control can not be installed in applications in which:
- Flameproof characteristics are required.
- The movement and/or lifting of persons is made and safety characteristics are required on the STOP command.
- The loss of the link and the consequent shutdown of the receiver outputs may generate dangerous situations.
- The risk analysis has given a negative result.
- Doubt concerning the operation of the remote control remain.

2.3 INSTRUCTIONS FOR PROPER AND SAFE USE



IMPORTANT! The remote control user MUST:

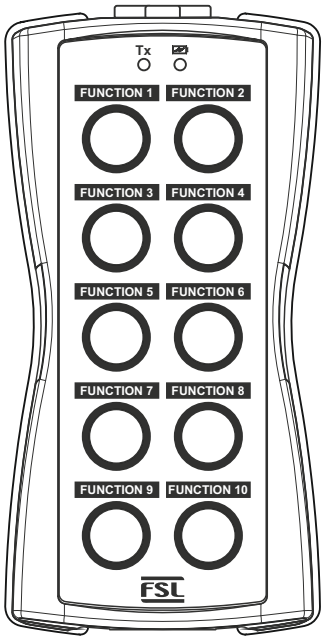
- Check the correct operation of the control devices.
  - If there is a deterioration in the correct operation or functional abnormalities in the control devices, the use of the remote control must be prohibited until the full restoration of the system's functionality.
- Use the transmitter by holding it or fastening it to the body in a safe and stable manner to avoid it accidentally falling.
- Be thoroughly familiar with the functions and features of the radio remote control and of the machine the receiving unit is connected to.
- Before activating any movement of the machine, ensure that the operator's position is such to ensure that:
  - There is NO danger of tripping
  - There is NO danger of loss of balance
  - Guarantee the safety conditions concerning those engaged in other operations, activities or work in the vicinity of the machine and operator.
- Disconnect the battery from the transmitter and also disconnect the power supply of the receiver before performing any maintenance on the remote control or on the machinery.
- DO NOT leave the transmitter unattended and switched on.
- Remember that the transmitter can operate the machine even when placed indoors and far from the receiver, so improper use can cause severe damage to people and property
- Never wash the transmitter or receiver with water jets, use a damp cloth only
- Charge the transmitter in an environment that is not too hot, too cold, too humid or dusty.
- Keeping the batteries partially charged at all times can extend their useful life.
- DO NOT leave the batteries discharged for long periods.
- Charge the batteries at least once a year even if the unit has not been used since the last charge.

IMPORTANT! The installer of the remote control must:

- Carry out a thorough risk assessment on the use of the machine with the remote control.
- Assess that there are no hazardous conditions in the event the remote control stops due to the loss of communication.
- DO NOT install the remote control on machines to which the safety of moving, lifting or transporting people is entrusted to the remote control.
- DO NOT install the remote control where explosion-proof characteristics are required of the remote control.
- Secure the receiver so that it is facing the transmitter in normal use.
- Ensure that there are no metal obstacles between the transmitter and receiver or obstacles that may cause interference.
- Install the receiver in a vertical position and easily accessible for maintenance operations.
- Ensure that the receiver is not subjected to strong vibrations (Use vibration dampers if necessary).
- Always make sure that the value of the supply voltage complies with the rated voltage of the receiver.
- Use multi-pole connectors for the electrical connection of the receiver to the machinery to allow easy removal if required.
- Use cables of suitable section, max. 2.5 mm
- Connect the Stop circuit making sure that the current circulating therein does not exceed the rating of the relays.
- Distribute the common wire to the functions interposing always the Safety relay.
- After installation check that the stop circuit works correctly.
- Ensure that all buttons are functioning correctly and are consistent with the symbols placed on the transmitter.

2.3 INSTRUCTIONS FOR PROPER AND SAFE USE (cont.)

Definition of the key functions:

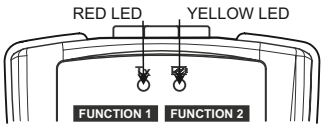


Enabling the remote control:

- Enabling THE TRANSMITTER. To wake the transmitter from sleep mode press any of the function buttons.
- AUTO SLEEP FUNCTION. When none of the function buttons on the transmitter are pressed for 10 seconds the transmitter will go to sleep - this is a state of low power consumption awaiting further use.

Safety function.

- PASSIVE EMERGENCY: In the event the receiver is no longer able to correctly interpret the signals from the Transmitter, due to the presence of interference or noise, the receiver stops automatically disabling all active outputs - Intervention time under 500 ms.
- ACTIVE EMERGENCY: With the remote control on, when pressing the Stop command is transmitted and the receiver turns off all outputs and opens the stop circuit. Intervention time under 200 ms.



Indicator LEDs.

The Red LED	Meaning
…is off	The transmitter is not active
... blinks fast	A control button is active and the transmitter is sending data to the receiver

The Yellow LED	Meaning
…is off	The transmitter is fully charged
... is steady on	The transmitter is charging

2.4 INFORMATION FOR INSTALLATION

The installation must be performed by qualified personnel and certified as required by law in some Countries.

Installation is of considerable importance, since it depends on the safety of the machinery, its operation and the ease to perform effective maintenance on the remote control. In addition to all information made available by the machine manufacturer, the installer should always take the following precautions:

- Perform a thorough risk assessment considering the use of the machine by means of the remote control.
- Apply and comply with the provisions of the reference standards for the field of application of the machine on which installation is being performed.
- Position the receiver unit so that it is easily accessible for maintenance operations.
- Connect the receiver unit to the machine using multi-pole connectors so that it can be easily disconnected in the event that it needs to be sent to a service centre.
- Position the receiver unit so that it is as far away as possible from metal parts (at least 50 cm) and never inside metallic or conductive materials.
- Avoid exposing the receiver unit to strong vibrations. If necessary, use appropriate anti-vibration systems.
- For wiring, use cables of suitable diameter max. 2.5 mm² terminated with wire clips or terminals.
- The power supply of the receiver unit must be protected against short circuit.
- Provide for the possible disconnection of the power supply to the receiver unit during installation, wiring and maintenance operations.
- Avoid using the connector for the power supply of the receiver unit to distribute power to the control relays.
- Pay attention to the current in the STOP relays so that it never exceeds the permitted value.
- The STOP relay contacts must be connected in series with the common wire of the movement command when
- the safety protection is required in relation to the involuntary activation of the control with actuator at rest.
- IT IS IMPERATIVE that the two STOP contacts on the receiver are always used, also connect the two STOP relay contacts in series. The installer is responsible to perform the wiring and the level of security required.
- Join the wires together by means of binding, making sure that the wires are away from the electronic module and are sufficiently fastened so they remain stationary even if released from the connector, and avoid potential hazards related to electrical safety.
- After installation, test the machine operated by the remote control, checking the actual safety of the machine by means of the STOP command, the exact correspondence of the command symbols with the actual movement of the machine.
- Check that operations that render the machine's safety systems ineffective are not performed during installation (limit switches, interlocks, etc..).
- Check also the correct operation of the machine without the use of the remote control where possible.
- If abnormal operations are experienced, DISABLE the machine until the complete resolution of the problem.
- Close the receiver units checking firstly the integrity of the gasket in the cover.

2.5 MAINTENANCE

Before proceeding with any kind of maintenance operation, make sure that:
- The receiver is NOT powered
- The transmitter is off

In the event it is necessary to intervene on the machine or on the receiving unit for maintenance operations:
- Electrically disconnect the receiver unit from the machine.

Even though the remote control system does not require special maintenance operations, some precautions are nevertheless necessary so that it remains fully efficient at all times.

Controls to be carried out daily before using the remote control:
- Check the integrity of the transmitter's plastic casing. It should not have cracks.
- Check the integrity of the buttons. They should not have any cracks or holes.

Controls to be performed weekly:
- Clean the transmitter with a damp cloth and verify its integrity.
- Check the integrity of the receiving unit. The casing should not have cracks.

Controls to be performed monthly:
- Clean the receiving unit with a damp cloth and assess its integrity.
- Ensure that all screws on receiver and transmitter are secure
- Ensure that all wiring to the PCB connectors on the receiver are secure

Controls to be performed yearly:
- Open the receiving unit and verify the integrity of the internal components.
  There should be no residual moisture or oxidation.
- Check the integrity of the receiving unit's gasket on the cover.
- Check the seal of the cable on the cable glands.
- Perform a full charge in the event of prolonged disuse of the system.
- Check the aerial connections on the receiver
- Check mounting screws on receiver

In addition to the above recommendations, in order to maintain the efficiency of the radio remote control System, the following precautions should be carried out:
- Protect the transmitting unit from jets of water or rain.
- Remove the receiving unit if it is installed externally during transport. In case of rain during transport, the receiver’s IP level may not be sufficient to prevent water seepage.
- Do not leave the transmitter unnecessarily exposed to direct sunlight or heat sources.

2.6 WARRANTY

1.1 Subject as otherwise stated herein, FSL Electronics Limited warrants that the Goods are free from significant defect in workmanship and materials at the date of delivery and for the period of 1 months thereafter. Where the Goods are not of FSL Electronics Limited manufacture, the warranty period and its terms shall be limited to such warranty as FSL Electronics Limited receives from the manufacturer(s) of the Goods and FSL Electronics Limited shall endeavour to transfer to the Purchaser the benefit of any warranty or guarantee given to FSL Electronics Limited.

1.2 FSL Electronics Limited warranty shall be limited as follows:

1.2.1 FSL Electronics Limited liability under the warranty shall be limited to the supply of labour and materials to repair any defects in the Goods, or at FSL Electronics Limited option, to replace the defective Goods or refund the purchase price paid by the Purchaser. FSL Electronics Limited shall supply the said labour and material free of charge, save for transport costs, travelling time and engineer expenses, and

1.2.2 FSL Electronics Limited shall have no liability in respect of any defect arising from (a) any drawing, design or specification supplied by the Purchaser of (b) fair wear and tear, wilful damage, negligence, failure by the Purchaser (or the Purchaser's customer) to follow FSL Electronics Limited instructions (whether written or verbal) as to the storage, practice, misuse (including use of the Goods for purposes inconsistent with the specifications, incorporation of the Goods into another product without FSL Electronics Limited prior approval in Writing;

1.2.3 FSL Electronics Limited shall have no liability if the total price payable for the Goods has not been paid by the Purchaser by the due date; and

1.2.4 If FSL Electronics Limited complies with this Condition 1.2, it shall have no further liability for a breach of the warranty contained in Condition 1.1

1.3 The warranty at clause 1.1 is conditional upon the following:

1.3.1 Notice of the defect must be delivered to FSL Electronics Limited in Writing within 7 days of the date of delivery or where the defect was not apparent upon reasonable inspection on delivery, within 7 days of the discovery of the defect, and

1.3.2 Where the defect is discovered (and notified to FSL Electronics Limited) within 7 days of the date of delivery, the Purchaser must give FSL Electronics Limited a reasonable opportunity to arrange for inspection of the Goods in the condition and location in which they were delivered, or

1.3.3 Where the defect is discovered at a later date, the Goods in question (a) must have been properly stored and/or operated by the Purchaser prior to the defect occurring, (b) must not have been subjected to abnormal use or any modification prior to the defect occurring, and (c) the Purchaser (at the expense) must return the Goods in question for inspection by FSL Electronics Limited should FSL Electronics Limited so request.

1.4 The above warranty will be void and FSL Electronics Limited will not have any liability to the Purchaser where:

1.4.1 The provisions of Condition 1.3 have not been complied with in full by the Purchaser; or

1.4.2 The Purchaser shall not, nor directly or indirectly assist any other person to, copy or reverse engineer any Goods provided by the Company or do anything which would infringe the FSL Electronics Limited Intellectual Property in the Goods and the specification and design of the Goods and the Purchaser shall not remove, deface or obscure any branding, company details, trade mark, registered design number or patent number on the Goods.

1.5 The Goods are sold on the basis that the Purchaser does not deal as a consumer (within the meaning of the Unfair Contract Terms Act 1977) and that the Purchaser has satisfied itself as to the suitability of the Goods for use or resale by the Purchaser in accordance with the Purchaser's specialised knowledge and skill. In particular, FSL Electronics Limited expressly disclaims all warranties that use of the Goods or any part thereof will result in any economic advantage, increase in profits or reduction in costs.

1.6 Nothing in the Contract shall limit the liability of FSL Electronics Limited to the Purchaser for death or personal injury resulting from its negligence (as defined in the Unfair Contract Terms Act 1977), for fraudulent misrepresentation, for breach of FSL Electronics Limited obligations arising from Section 1 of the Sale of Goods Act 1979 or for any liability which cannot be excluded by law.

1.7 Subject to Condition 1.6 and the limitations in Condition 1.2, the following provisions set out the limitations on the liability of FSL Electronics Limited (including any liability for the acts and omissions of its respective employees, agents and sub-contractors) to the Purchaser with respect to:

1.7.1 Any breach of its contractual obligations arising under the Contract.

1.7.2 Any use made or resale by the Purchaser of any of the Goods, or of any product incorporating any of the Goods; and

1.7.3 Any representation, statement, act or omission given, made or carried out under or in connection with the Contract (whether such liability arises in contract, tort, negligence, misrepresentation, breach of statutory duty or otherwise howsoever).

2.6 WARRANTY *(cont.)*

1.8 Except as expressly set forth in the Contract, all conditions, warranties and representations expressed or implied by statute, common law or otherwise with respect to the Goods are excluded to the fullest extent permitted by law and in no event shall FSL Electronics Limited be liable for any negligence or tortuous loss or for any of the following losses or damage (whether such losses or damage were foreseen, foreseeable, known or otherwise and whether or not FSL Electronics Limited is advised of the possibility of loss, liability, damage or expense);

1.8.1 Loss of revenue.
1.8.2 Loss of actual or anticipated profits (including for loss of profits on contracts).
1.8.3 Loss of the use of money.
1.8.4 Loss of anticipated savings.
1.8.5 Loss of business.
1.8.6 Loss of operating time or loss of use.
1.8.7 Loss of opportunity.
1.8.8 Loss of goodwill.
1.8.9 Loss of reputation.
1.8.10 Loss of, damage to or corruption of data; or
1.8.11 Any indirect or consequential loss or damage howsoever caused (including, for the avoidance of doubt, where such loss or damage is of the type specified in Conditions 1.8.1-1.8.10)

1.9 Except as stated in Condition 1.6, the aggregate liability of FSL Electronics Limited to the Buyer with respect to all claims under or in connection with the Agreement shall be limited to the price of the Goods which gave rise to liability.

1.10 FSL Electronics Limited shall not be liable to the Purchaser in any way whatsoever or be deemed to be in breach of the Contract for any delay in performing, or any failure to perform, any of FSL Electronics Limited obligations in relation to the Goods, if the delay or failure was due to any cause beyond FSL Electronics Limited reasonable control.

1.11 Without prejudice to the generality of the foregoing, the following shall be regarded as causes beyond FSL Electronics Limited reasonable control: Act of God, explosion, flood, tempest, fire or accident; war or threat of war, sabotage, insurrection, civil disturbance or requisition; acts, restrictions, regulations, bye-laws, prohibitions or measures of any kind on the part of any governmental or local authority; import or export regulations or embargoes; strikes, lock-outs or other industrial actions or trade disputes (whether involving employees of FSL Electronics Limited or of a third party); difficulties in obtaining raw materials, labour, fuel, parts or machinery; and/or power failure or breakdown in machinery.

1.12 In circumstances such as those in Condition 1.11, delivery shall be suspended. FSL Electronics Limited shall be entitled to cancel or rescind the Contract and shall not be liable for any loss or damage as a result of such cancellation or rescission. If the Goods cannot be delivered or collected within three months from the original delivery date, the Purchaser may, at its option, cancel the contract for the Goods (without liability to FSL Electronics Limited), save that where the Goods have been specially obtained for the Purchaser and in FSL Electronics Limited reasonable opinion there is no readily available market for them, the Purchaser may not cancel the order and shall remain liable to pay FSL Electronics Limited the full purchase price for the Goods.

1.13 The Customer acknowledges and agrees that it is aware of the Waste Electrical and Electronic Equipment Regulations ("WEEE Regulations") and FSL Electronics Limited obligations thereunder. For the avoidance of doubt, the WEEE Regulations require any importer, rebrander or manufacturer of new electrical or electronic equipment ("EEE") or a business with EEE to dispose of, or a Company of EEE to ensure the proper and correct treatment, recovery and environmentally sound disposal of waste electrical or electronic equipment ("WEEE").

1.14 Pursuant to the relevant provisions of the WEEE Regulations, the Customer acknowledges and agrees that any obligations imposed on FSL Electronics Limited by the WEEE Regulations for the correct treatment, recovery and environmentally sound disposal of the WEEE shall transfer to the Customer upon the purchase of any EEE from FSL Electronics Limited. The Customer further acknowledges and agrees that it shall (at its sole cost and expense) duly comply with the WEEE Regulations in order to ensure the correct treatment, recovery and environmentally sound disposal of WEEE. The Customer shall (at its expense) be responsible for any and all information recording or reporting obligations imposed by the WEEE Regulations in respect of the treatment, recovery and environmentally sound disposal of the WEEE.

2.7 RETURNS

Where FSL Electronics accepts that it has supplied the wrong goods (but not otherwise), FSL Electronics will issue a returns number with which the Purchaser shall identify the relevant goods prior to returning them to FSL Electronics. FSL Electronics will refund all reasonable costs incurred by the Purchaser in returning the goods. In all other cases, returned goods shall only be accepted by FSL Electronics by prior agreement and then if return carriage is pre-paid by the Purchaser.

2.8 DISPOSAL INFORMATION

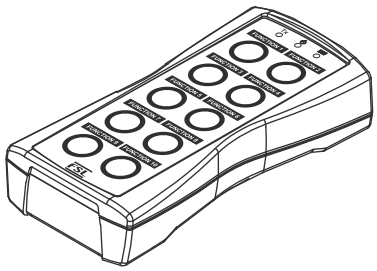
The radio remote control must be delivered to separate collection at end of life.
DISPOSAL OF BATTERIES, Directive 2006/66/EC and subsequent amendments.
Batteries may release toxic substances harmful to humans, animals and plants and contaminate the environment. They should be not disposed of with municipal solid waste but delivered to authorised collection centres for battery recycling and treatment.
Users' contribution to collect and recycle batteries is critical to minimising the potential impact of the contaminants used in these components on the environment and human health.
The European Union has set up different battery collection and recycling systems. For information on the method adopted in your area, contact your local authorities.
The crossed-out wheeled bin symbol on the batteries means that batteries must be disposed of separately from household waste in compliance with Directive 2006/66/EC and subsequent amendments and with local regulations

3. TECHNICAL DATA

3.1 GENERAL DETAILS

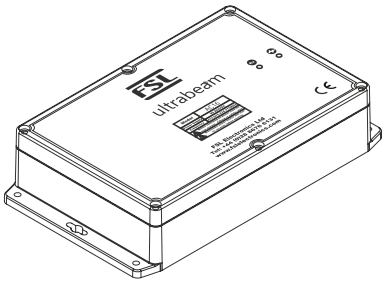
Manufacturer.....FSL ELECTRONICS Ltd
Remote Control System type .....UBIR
Working frequency.....700 nanometers
Working temperature .....from -20 °C to +55 °C
Storage and transportation temperature.....from -25 °C to +55 °C
Operating range..... 20 m
Command response time..... < 100 ms
Active Stop time..... < 100 ms
Passive Stop time (maximum stop time)..... < 500 ms

3.2 TRANSMITER DETAILS



Model..... PG10-IR
Power supply.....Li-Po 3.7 V battery
Current draw.....< 150 mA
Absorbed power..... < 0.15 W
Run time with fully charged battery at 20 °C.....approximately 20 hours
Protection degree.....IP65
Dimensions.....160x78x36 mm
Weight.....210 g

3.3 RECEIVER DETAILS

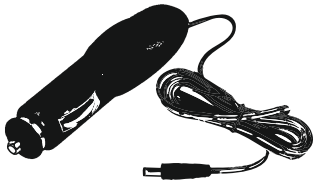


Model..... AC16-IR
DC power supply .....24V DC
Absorbed current.....70 mA
Maximum capacity of the function relay contacts.....10 A
Maximum capacity of the STOP relay contacts.....6 A
Maximum contact voltage.....230 V ~ 50/60 Hz
Protection degree IP65
Dimensions.....252x175x55 mm
Weight 600g

3.4 AC CHARGER DETAILS

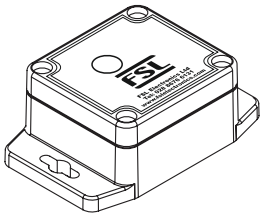
Model.....PA31/CHARGER/01
Supply voltage.....100 - 240 V ~ 50/60 Hz
Absorbed current.....0.2 A
Rated output voltage.....5 V DC
Rated output current.....1 A
Full recharging time .....approx 4 hours
Charge time for 2 hours of run time .....approx. 20 minutes
Working temperature .....from -25 °C to +55 °C
Protection degree IP40
Electric plug model .....UK Plug
Cable length .....1.5 metres
Weight.....75 g

3.5 DC CHARGER DETAILS



Model.....PA31/CHARGER/02
Supply voltage.....12-24V DC
Absorbed current.....0.2 A
Rated output voltage.....5 V DC
Rated output current.....2.1 A
Full recharging time .....approx 4 hours
Charge time for 2 hours of run time .....approx. 20 minutes
Working temperature .....from -25 °C to +55 °C
Protection degree IP40
Cable length .....1.5 metres
Weight.....75 g

3.6 EXTERNAL IR PICK-UP DETAILS



Model..... UB/IR-PICK-UP/05
Supply voltage.....3.3V DC
Absorbed current.....0.03 A
Cable length .....3.0 metres
Protection degree IP65
Dimensions..... 94x58x35 mm
Weight.....155 g

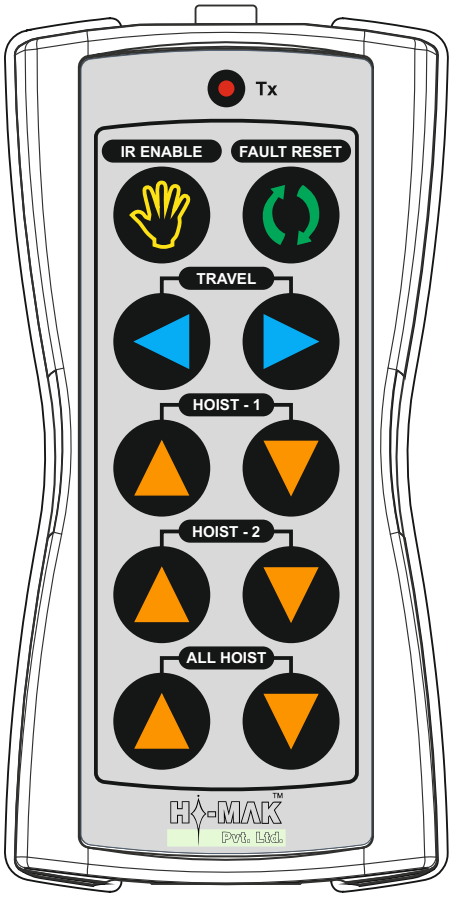
4. TRANSMITTER

4.1 DESCRIPTION OF OPERATION

The Progrip10 transmitter is programmed with a unique identification serial number that allows the receiver to identify which handset has transmitted the command.
This means that any other device that is transmitting on the same frequency can not in any way take over control of the machine to which the system is connected.
Any transmissions on the same working frequency as the transmitter or any RF interference, in the worst case scenario will switch off the active outputs on the receiver (See receiver operation).

The function buttons when pressed will wake the transmitter from sleep mode and automatically start transmitting to the receiver indicated by the Red LED blinking.
Upon release of the button the transmitter will continue to transmit for 100mS after the button is released and the Red LED will stop blinking.
If no buttons are pressed for 20 seconds the transmitter will go back to sleep

The function buttons on the transmitter are single press buttons and have no interlocks with any other buttons.



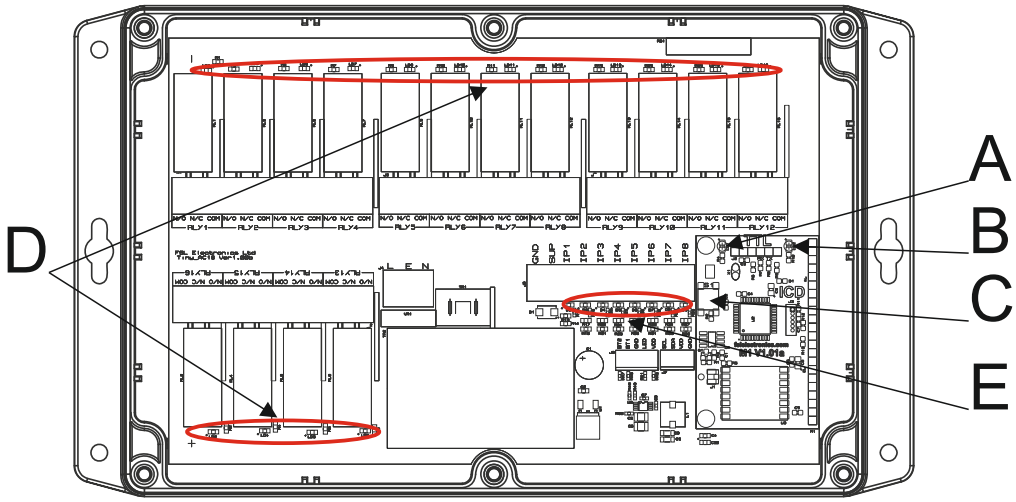
5. RECEIVER

5.1 DESCRIPTION OF OPERATIONS

The receiver consists of two main parts.

- RELAY BOARD.
It contains the STOP, and command relays, the terminals for the electrical connections, the power supply and the connections of the PROCESSOR MODULE.

- PROCESSOR MODULE
It contains all the electronics for the reception of the commands transmitted from the transmitter and the control of the relays. It also contains the pair switch and the led indicators.



A	Heartbeat LED
B	Receive LED
C	Pair Switch (S1)
D	Output Active Indication LEDs
E	Input Active Indication LEDs

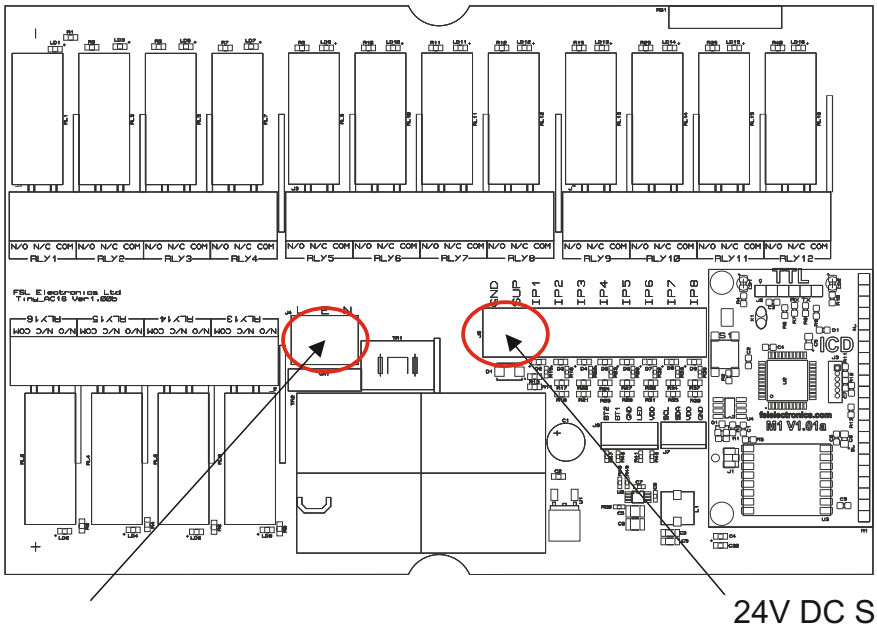
The Red LED (A)	Meaning
…is off	The receiver is not switched on
... blinks	The receiver is operating as normal

The Blue LED (B)	Meaning
…is off	No data is being received from the transmitter
... blinks	The receiver is receiving data from the transmitter

The Amber LEDs (D)	Meaning
…is off	The relay is not energised
... is steady on	The relay is energised

The Green LEDs (E)	Meaning
…is off	The input is not energised
... is steady on	The input is energised

5.2 WIRING EXAMPLE

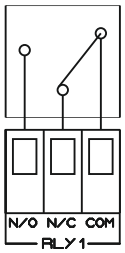


24V DC Supply

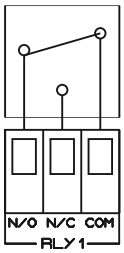
The AC supply to the receiver is via the 3 way connector.
The pin marked L is the 90-264V AC live supply.
The pin marked E is the earth pin.
The pin marked N is the 0 V AC neutral supply.

The DC supply to the receiver is via the 10 way connector.
The pin marked SUP is the 24 V DC supply.
The pin marked GND is the 0 V DC return.

Each Relay on the receiver has a Common (COM), Normally Open (N/O) & Normally Closed Connection (N/C).
These connections are isolated from the other relays on the board.

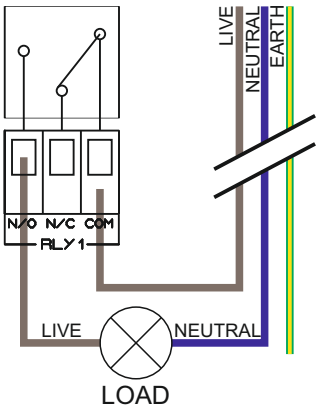


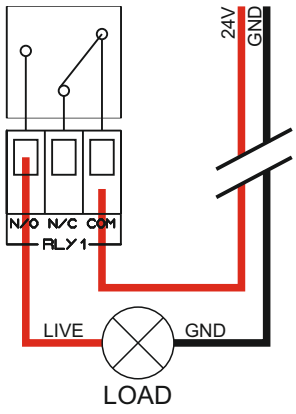
Relay connection when relay is not energised



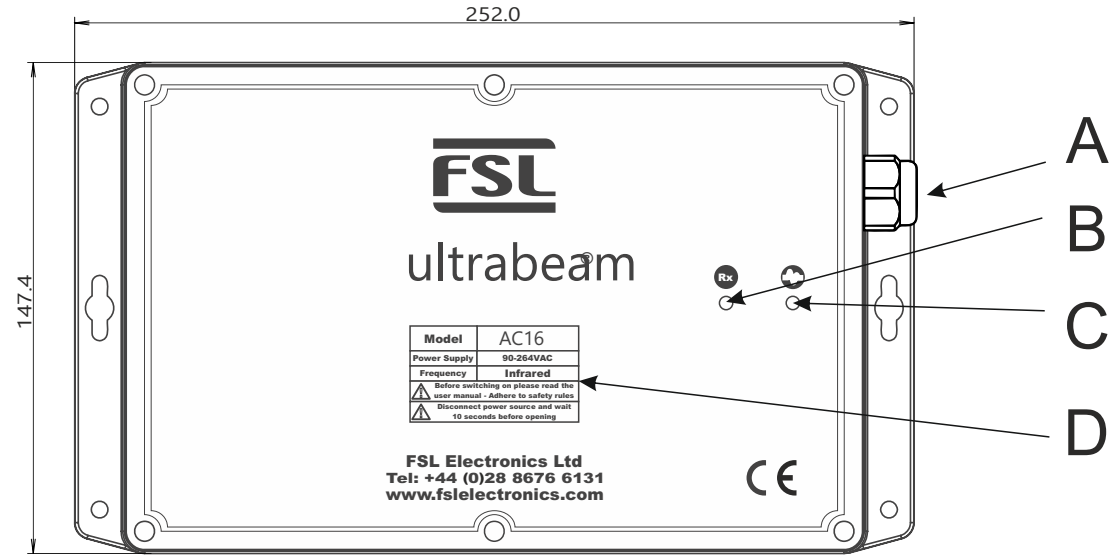
Relay connection when relay is energised

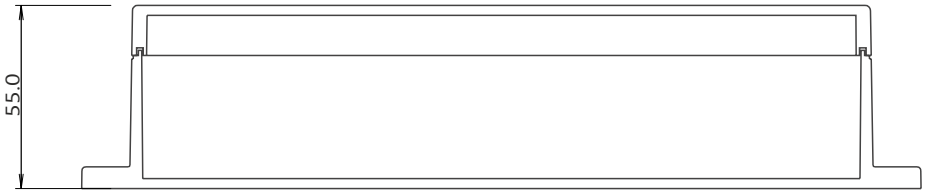
Below is a simple example showing possible ways to connect a load to the relay contacts.

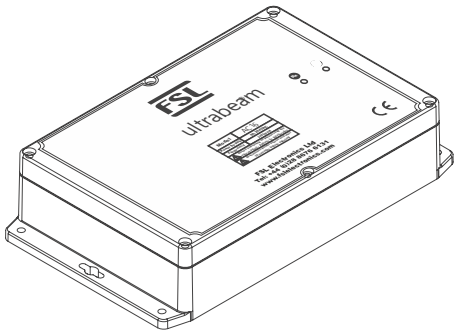




5.3 RECEIVER DIMENSIONS

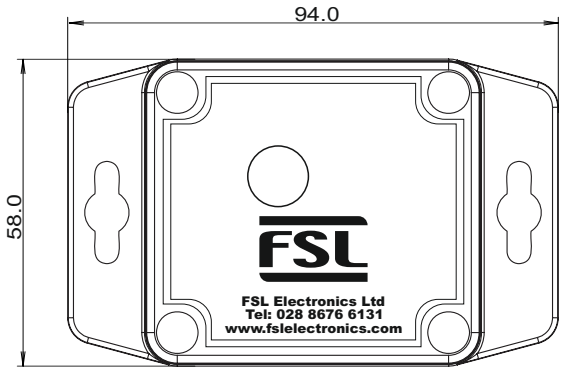


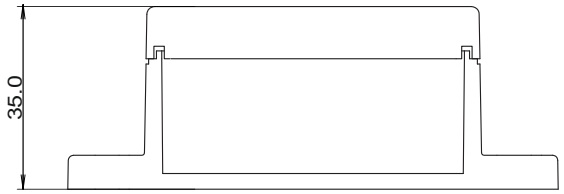


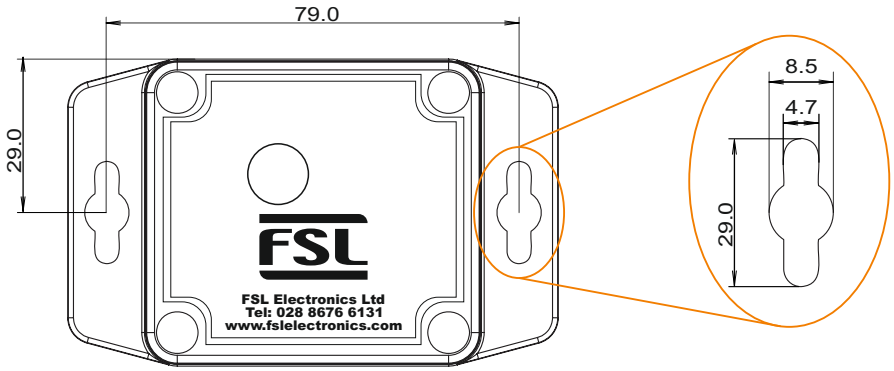


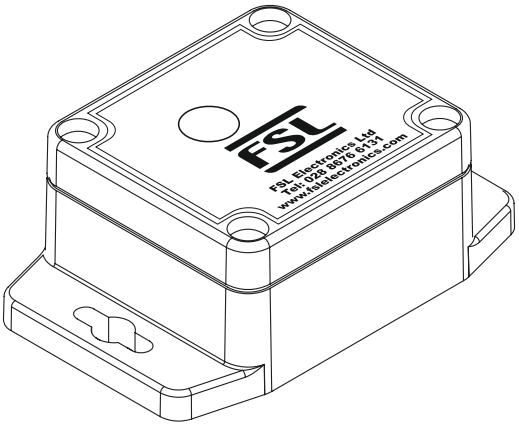
A	Cable to external eye
B	Receive LED
C	Heartbeat LED
D	Identification

5.4 EXTERNAL IR PICK-UP DIMENSIONS







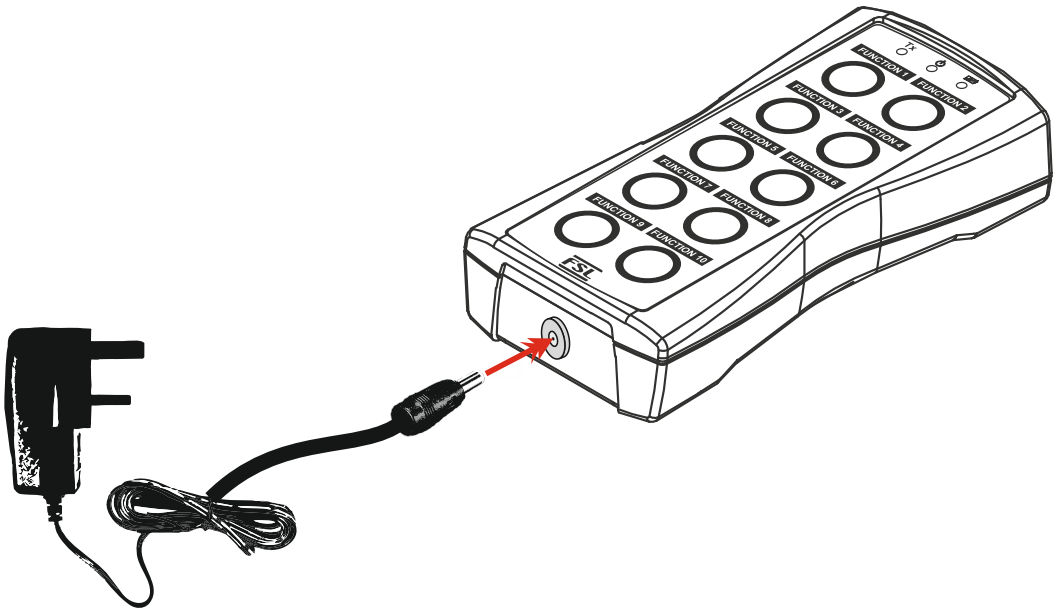


6. BATTERY CHARGER

6.1 BATTERY CHARGER USAGE

The transmitter must be recharged in an environment in which the temperature ranges between 0°C and 40°C.
This will obtain maximum performance in terms of the charging capacity and useful life of the battery.
Check that the electrical connection poles are clean and dry before connecting the charging system.

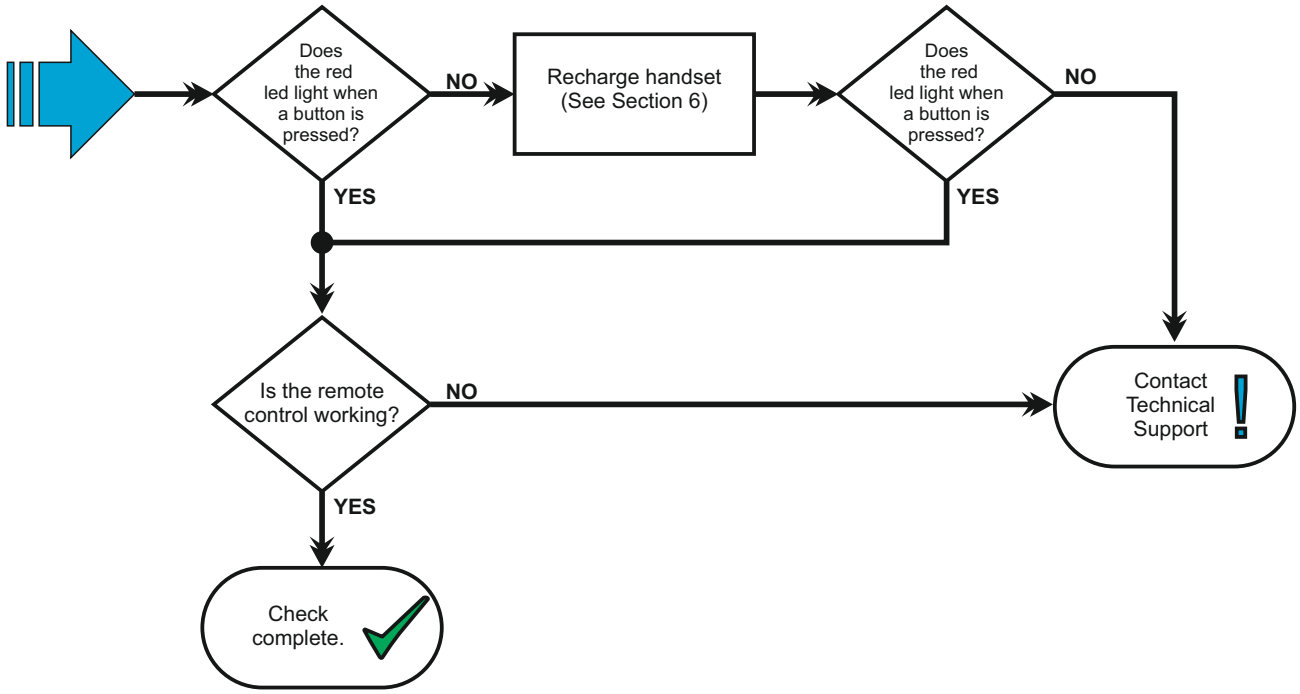
Indicator light:
When the charger is connected to the handset, the Yellow LED indicator will light to indicate that the handset has started charging.
When the battery is fully charged, the Yellow LED indicator will go off.
The full charging process lasts approx. 4 hours.
The Li-Po batteries allow a rapid charging process in the initial part of charging with 75% of the charge being obtained in two hours of charging, equivalent to about 15 hours of run time.
A charge of just 20 minutes can ensure approximately 3 hours of run time.
It is advisable to always keep the batteries fully charged to be able to ensure full effectiveness.
Avoid leaving the batteries discharged for long periods.
Charge the batteries at least once a year.



7. TROUBLESHOOTING

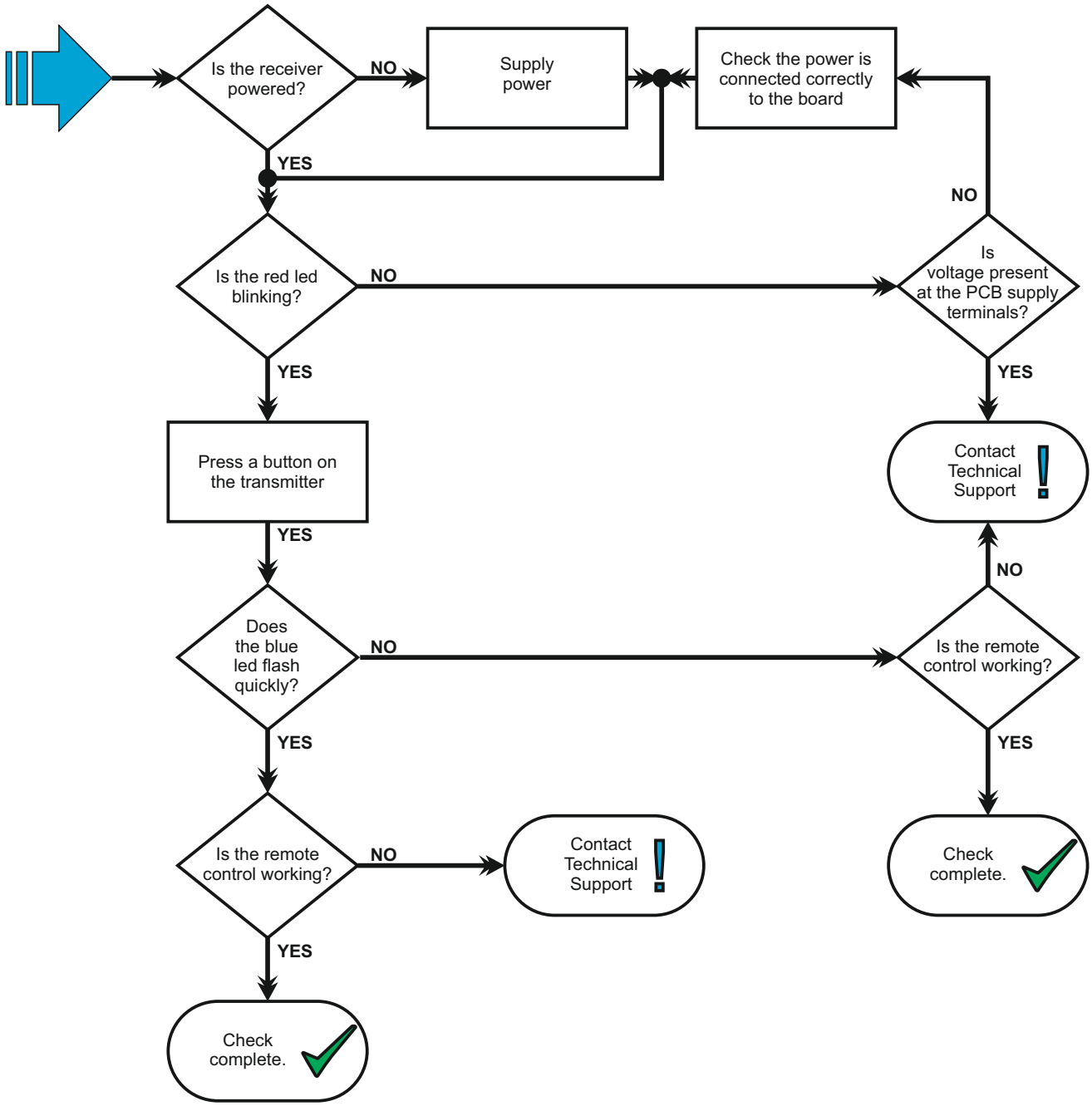
7.1 TRANSMITTER DIAGNOSTICS

Follow the diagram below (starting from the top left corner) to help solve or identify the problem.



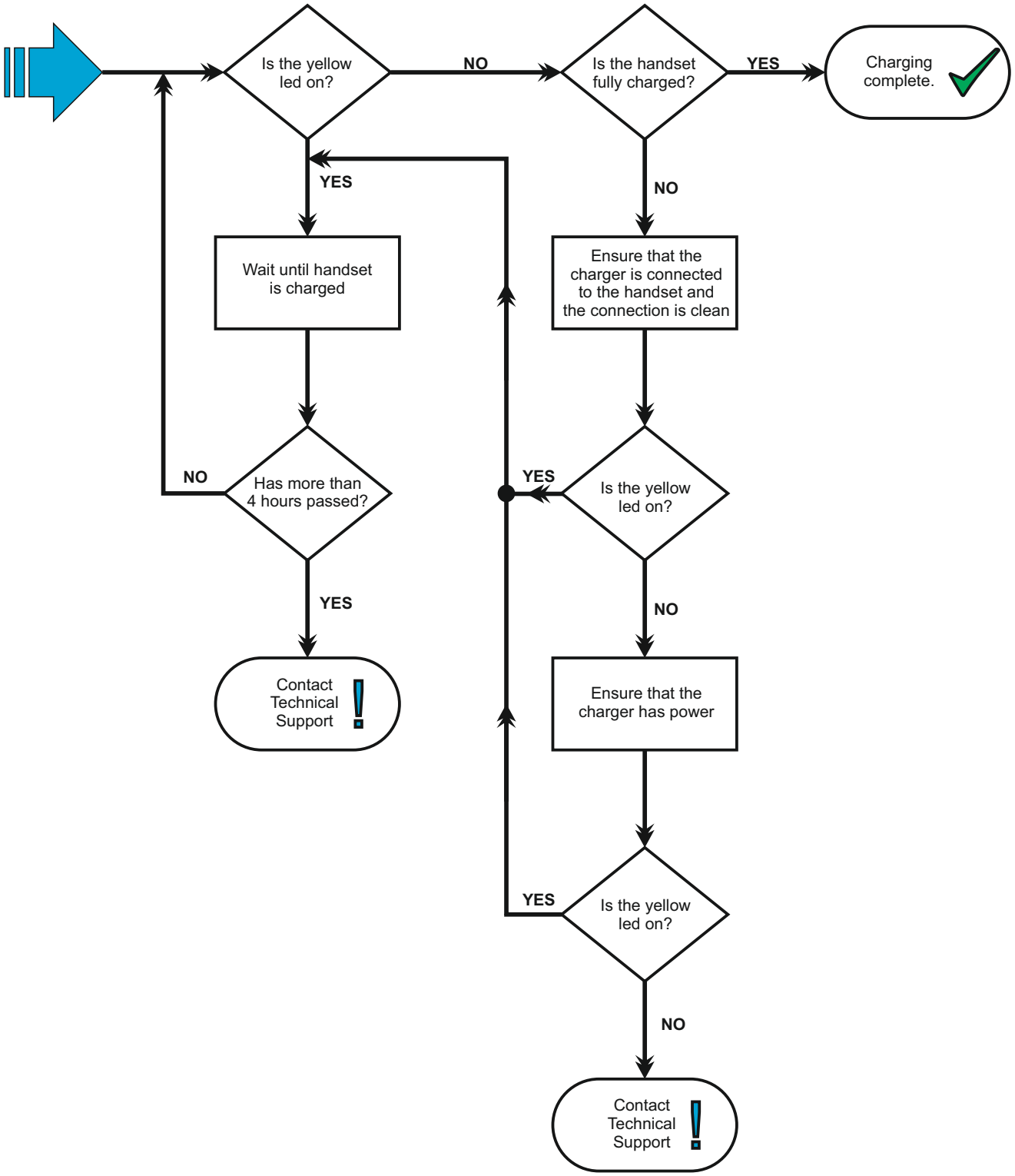
7.2 RECEIVER DIAGNOSTICS

Follow the diagram below (starting from the top left corner) to help solve or identify the problem.



7.3 CHARGING DIAGNOSTICS

Follow the diagram below (starting from the top left corner) to help solve or identify the problem.



Notes:

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