

MANUAL V2.2

Remote Kart & Track Control
Xtra.Robust Xtra.Track Safety
.....
the new standard



the **Xtra.series**
from the only original one

de Haardt

ELECTRONIC ENGINEERING

Date : 11-06-2013
Version : V2.2

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De Haardt Electronic Engineering BV
Marithaime 6
6662 WD Elst (GLD)
The Netherlands
Tel: 0481 353202
Fax: 0481 353603

All products are designed as *supplement* to make karting safer, but *cannot* replace safe track procedures. If equipment fails, the normal operating procedure must still be adequate to safely operate the track.

This guide has been written with great care. However, the manufacturer cannot be held responsible, either for any errors occurring in this publication or for their consequences.

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2 Safety summary

To ensure thorough understanding of all functions and to ensure efficient use of the system, please read this manual carefully before using.

Please observe the following basics to prevent fire, burn, electric shock, and personal injury:

- Electrical and mechanical installation and servicing is only allowed by qualified personnel.
- Be sure to plug mains powered equipment in an electrical outlet which has a safety ground terminal.
- Never use the equipment with the case open.
- Service and repairs are only allowed by qualified technical engineers.
- Be sure to use fuses rated to the voltage in question.

3 Introduction

This document describes the standard operation and installation of the Xtra.Remote Kart and track control system.

The different parts of a standard Xtra.Remote Kart and Track Control system are:

- Xtra.Remote Control Unit
- Xtra.CDI Shutdown Transponder and Xtra.Twin Shutdown Transponder
- Xtra.Sector Beacon
- Xtra.Sector Sensor
- Xtra.Range Extender / Access point
- Xtra.Light Control Board
(Start/Stop warning & race)

If you are not using all parts of our Xtra.Remote kart and track control system, then you can skip the chapters concerning those parts.

4 Installation

4.1 Xtra.Remote Control Unit

The following accessories are related to the Remote Control Unit:

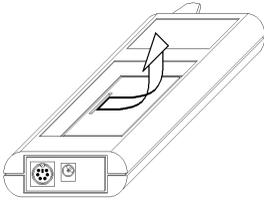
- Remote Control Unit
- Adapter (500 mA @ 12V DC)
- Serial cable
- Pair of rechargeable batteries (NiMH)
- Leather carriage bag / Industrial silicon cover

4.1.1 Placing the batteries

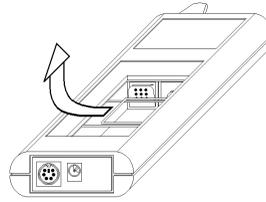
The Xtra.Remote Control Unit can be equipped with 2 rechargeable NiMH batteries type AA. To place these batteries, open the battery cover. Pull the 'lock' spring towards the inside. Place the batteries according to the symbols + and – labeled in the battery compartment. Close the battery compartment by sliding the spring to the right and close the cover.

Important:

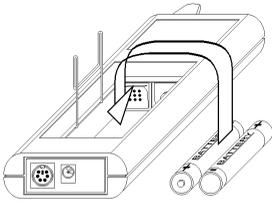
- Use only rechargeable batteries of the type NiMH, and no conventional batteries.
- Do not use old and new batteries together, or batteries from different manufacturers.
- Batteries contain chemical substances. Treat old batteries as chemical waste and don't leave them in the vicinity of children.



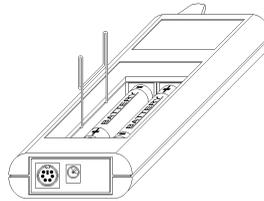
1. Open battery cover



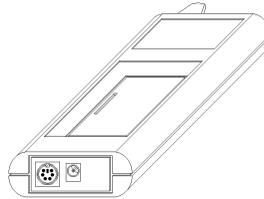
2. 'Unlock' the spring



3. Place the batteries in the battery compartment



4. close the spring

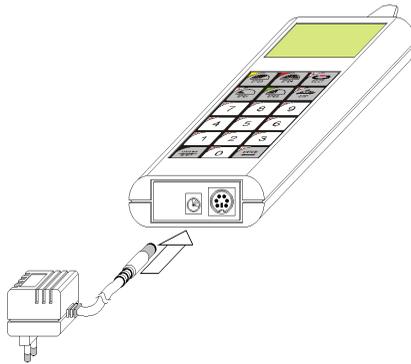


5. Close the cover

4.1.2 Connecting the adapter

Connect the provided adapter to the DC power connector of the Xtra.Remote Control unit and plug the adapter into the mains power supply socket.

Connecting the adapter to the Remote Control allows it to be used without batteries. The adapter can also be used to charge the NiMH batteries in the Xtra.Remote Control.



4.1.3 Connecting the antenna

The antenna of the Xtra.Remote Control can be fastened on the top side connector by turning clockwise. Do not apply excessive force as this could cause damage!

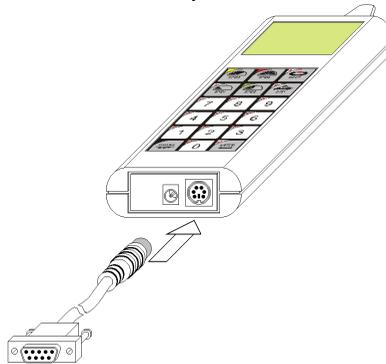
Caution: Do never use the antenna as a handle. Do not lift the Xtra.Remote control out of the carriage bag by its antenna.



4.1.4 Connecting to a Personal Computer

The Xtra.Remote Control can be connected to a PC by means of a serial cable.

This serial link gives third parties the ability to control and monitor the karts and track by means of a PC.



4.2 Xtra.CDI Shutdown Transponder

To be able to limit the speed of the karts from a distance, every kart must be equipped with an Xtra.CDI Shutdown Transponder. Karts powered by 2 engines need an Xtra.TwinShutdown transponder.

Each Xtra.CDI Shutdown Transponder has a unique serial number, and by using the Xtra.Remote Control it is possible for the user to give every Xtra.CDI Shutdown Transponder a kart number, a group number and/or track number.

Assigning a track number to the Xtra.CDI Shutdown Transponder gives the possibility, when other kart circuits are close by, to control the karts independently of each other. A maximum of 4 tracks can be assigned.

This gives for example the possibility to assign a kart number 1 on every circuit, and only a Remote Control which is also assigned to the same track will have control over this kart.

The Xtra.CDI Shutdown transponder is standard provided with a connection for a brake switch. If a brake switch is connected and activated by pressing the brake pedal of the kart, the RPM of the kart is reduced.

On the Xtra.CDI Shutdown Transponder there is also a plug for a network connection. By means of this network connection (future) applications or devices can be linked, and communicate with the Xtra.CDI Shutdown Transponder.

Warning: *Continuous use of the Xtra.CDI Shutdown transponder as a speed-limiting device may degrade the lifespan of the engine.*

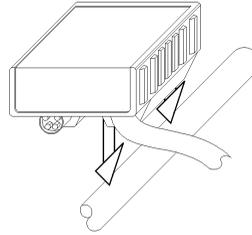
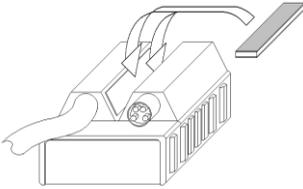
4.2.1 Assembly of the Xtra.CDI Shutdown Transponder (also valid for Twin Transponders)

The Xtra.CDI Shutdown Transponder is easy to install on the kart, by means of its V-shape based housing. It is possible to mount the housing both on round and/or square tubes.



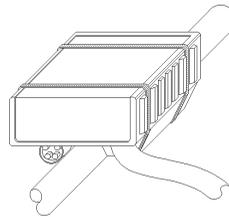
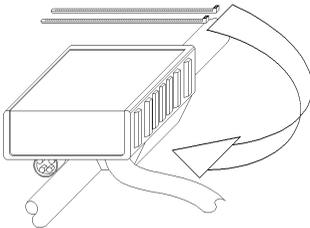
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By means of 2 tie wraps and 2 double sided adhesive strips it is possible to mount the Xtra.CDI Shutdown Transponder in most cases.



Place each of the double sided adhesive strips on one of the slanting V sides on the bottom part of the Xtra.CDI Shutdown Transponder.

Next, place the Xtra.CDI Shutdown Transponder on a frame tube of the kart, so that the adhesive strips keep the Xtra.CDI Shutdown Transponder in place.



Fasten the Xtra.CDI Shutdown Transponder with 2 tie wraps, and ensure that these cannot tremble off during the use of the kart or by other causes.

Warning: The best way of mounting the transponder to your kart depends heavily on your kart's framework. Therefore the mounting instructions mentioned above

should be considered as guidelines only. Because the transponder operates in a rough environment, every now and then a routine check-up must be made to ensure that the transponder is still properly fastened and shows no visual damage.

Keep the upper part (flat part) of the Xtra.CDI Shutdown Transponder away from any metal parts or wires and never place it facedown towards the track concrete.

There is no kart number printed on the Xtra.CDI Shutdown Transponder, only a serial number. Assigning a kart number, a group number and a track number to the Xtra.CDI Shutdown Transponder is explained in chapter 5.2.8 Menu->Shutdown tp->Assign on page 40.

Assigning the numbers is only possible when the Xtra.CDI Shutdown Transponder is has been connected to the engine, which is running.

When a new Xtra.CDI Shutdown Transponder is bought, the default kart number is factory set to the last 2 digits of the serial number.

Warning: *To prevent personal injury during installation of the Xtra.CDI Shutdown Transponder(s), the kart engine must be turned off.*

Warning: *Make sure that the Xtra.CDI Shutdown Transponder is not damaged before using the kart. In case of an accident or when the driver steps out of the kart please validate correct functioning of the Xtra.CDI Shutdown Transponder.
Do not mount the shutdown transponder next to the ignition.*

4.2.2 Electrical connection of the Xtra.CDI Shutdown Transponder (for conventional engines)

If you have one of the below mentioned engines, please use this wiring diagram to install the Xtra.CDI Shutdown Transponder on your kart.

Conventional Engines

GX 35 (U)T1

GX 35 (U)T2

GX 120 (U)T1

GX 120 (U)T2

GX 160 (U)T1

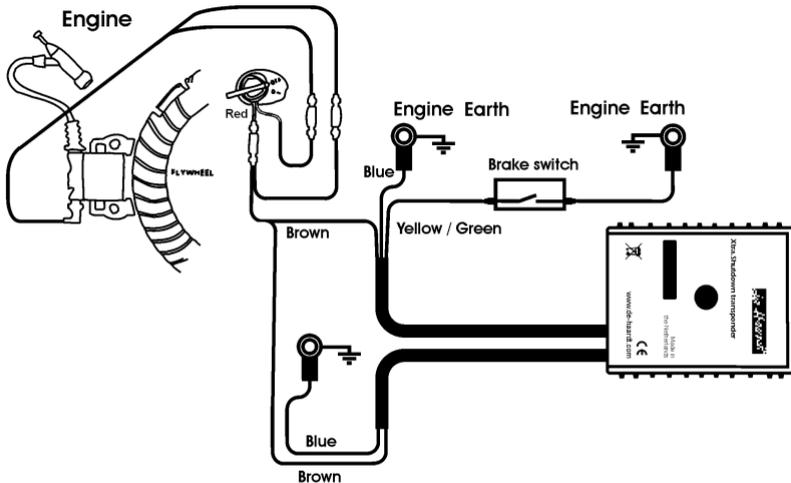
GX 160 (U)T2

GX 200 (U)T1

GX 200 (U)T2

GX 270 (U)T1

GX 390 (U)T1



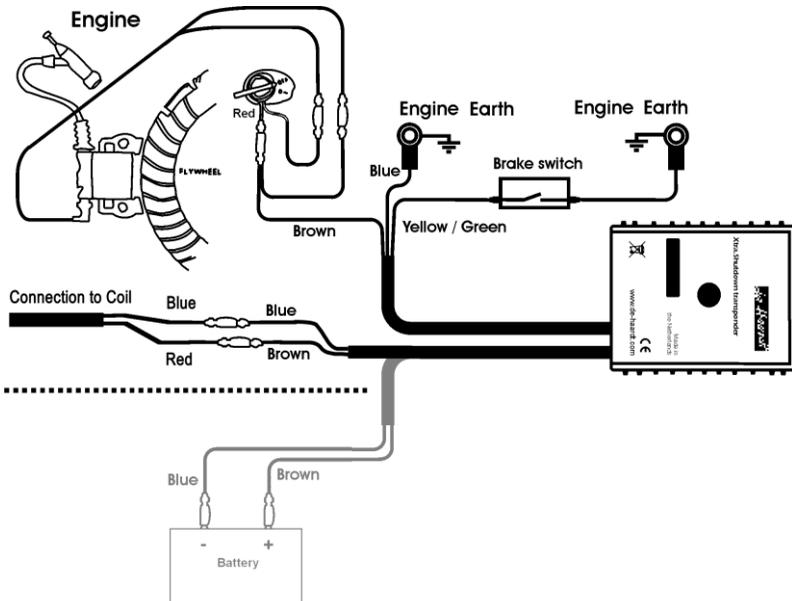
4.2.3 Electrical connection of the Xtra.CDI Shutdown Transponder (for CDI engines)

If you have one of the below mentioned engines, please use this wiring diagram to install the Xtra.CDI Shutdown Transponder on your kart

CDI Engines

GX 270 (U)T2

GX 390 (U)T2



The Xtra.CDI Shutdown Transponder has two cables on the transponder. A CDI based engine does not supply enough energy to power the transponder and has a different electrical signal then conventional engines.

The Xtra.CDI Shutdown Transponder has an additional wire to connect to a power source. This can be the De Haardt **Xtra.Universal power coil**, the battery of an electric starter or any other **9V to 24V DC power source**.

A charge coil or lamp coil without regulator and/or battery is not a DC power source. Please contact De Haardt to discuss the option when using a charge coil or lamp coil directly without regulator and/or battery.

The cable eye at the end of the blue wire of the Xtra.CDI Shutdown Transponder has to be fixed on the blank metal (mass) of the engine with a screw.

Pull apart the 2 connectors coming from red wire on the engine's On/Off switch and connect these to the connectors of the Xtra.CDI Shutdown transponder which are attached to the brown wire.

If the brake switch is used, the connector has to be connected to the yellow-green wire (possibly this wire has to be extended). The maximum length of the original wire together with the extension cable is 2 meters. The other contact of the brake switch must be fixed on the blank metal (mass) of the engine.

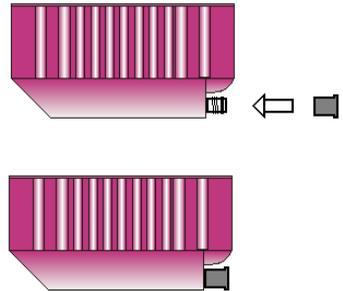
Important: Fix the mass wire of the brake switch and/or Xtra.CDI Shutdown Transponder always on a mass point of the engine block itself. Under no circumstances fix them on another mass point that is on the kart (like for example a frame tube).

Network Port:

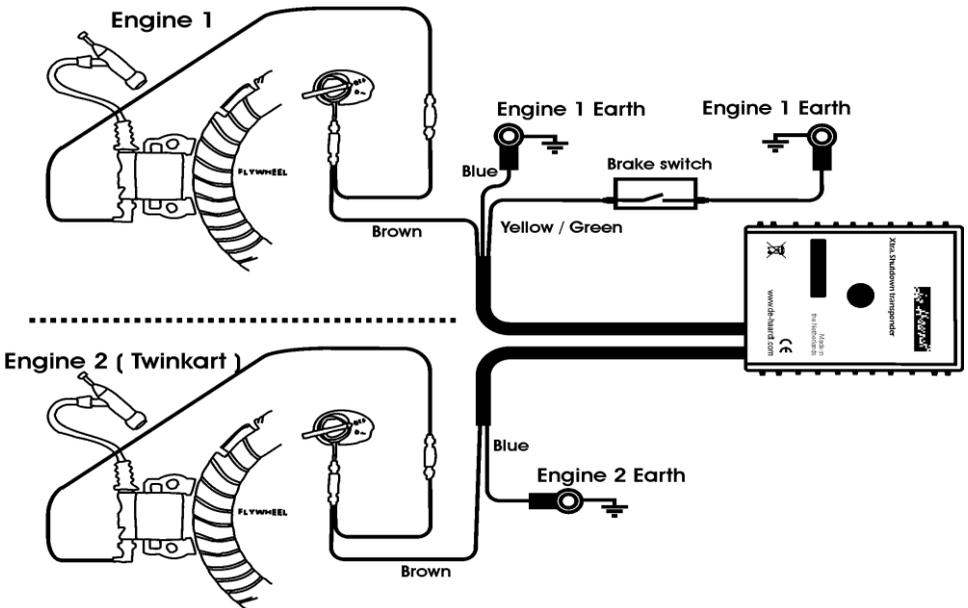
The Xtra.CDI Shutdown Transponder is fitted with a network port. Through this network port the Xtra.CDI Shutdown Transponder can be connected to other on-kart electronics.

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Warning: Always put the protection cap on the Xtra.CDI Shutdown Transponder's network port when this port is not used! Be sure that the protection cap is fully covering all outside metal parts of the network port connector. It is not allowed to connect devices to this network port which are not approved by De Haardt!



4.2.4 Electrical connection of the Xtra.Twin Shutdown Transponder



The Xtra.Twin Shutdown Transponder has two cables.

The second cable on an Xtra.Twin Shutdown transponder is connected in a similar way as the cable for the first engine, and therefore not specifically described in the text below.

The cable eye at the end of the blue wire of the Xtra.Twin Shutdown Transponder has to be fixed on the blank metal (mass) of the Honda GX... engine with a screw.

Pull apart the 2 connectors coming from the engine's On/Off switch and connect these to the connectors of the Xtra.Twin Shutdown transponder which are attached to the brown wire.

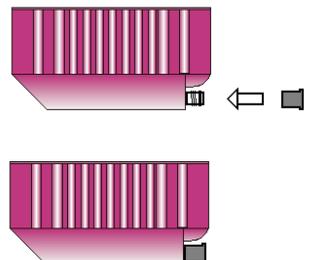
If the brake switch is used, the connector has to be connected to the yellow-green wire (possibly this wire has to be extended). The maximum length of the original wire together with the extension cable is 2 meters. The other contact of the brake switch must be fixed on the blank metal (mass) of the Honda GX... engine.

Important: Fix the mass wire of the brake switch and/or Xtra.Twin Shutdown Transponder always on a mass point of the engine block itself. Under no circumstances fix them on another mass point that is on the kart (like for example a frame tube).

Network Port:

The Xtra.Twin Shutdown Transponder is fitted with a network port. Through this network port the Xtra.Twin Shutdown Transponder can be connected to other on-kart electronics.

Warning: Always put the protection cap on the Xtra.Twin Shutdown Transponder's network port when this port is not used! Be sure that the



protection cap is fully covering all outside metal parts of the network port connector.

It is not allowed to connect devices to this network port which are not approved by De Haardt!

4.3 Xtra.Range Extender/Access point

The Xtra.Range Extender/Access point has a “relay” or “repeater” approach which helps to cover large and hard-to-reach areas and reflective corners on the race circuit.

The unit can also be used as an access point in case it is connected to the serial port of an external device. This gives for example third parties the ability to control and monitor the track and karts by means of a PC.

4.3.1 Mounting of the Xtra.Range Extender/Access point

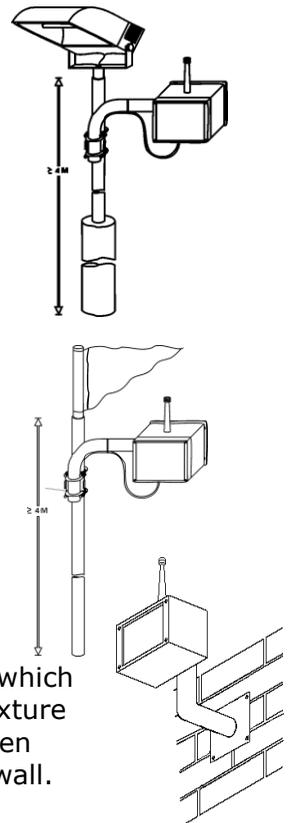
The operating range of the Xtra.Range Extender/Access point depends on the height of the antenna above the ground, line of sight, and obstructions in the line of sight.

Therefore we suggest for range extension on outdoor circuits to mount the Xtra.Range Extender/Access point on a mast of at least 4 meters high or on one of the track light poles.

Locate the mast(s) on (a) strategic position(s), in the centre of the operating areas where obstacles (like trees and buildings) in the line of sight are at a minimum.

If you are mounting the antenna on a roof, it must be at least 1m above the roof line.

For indoor use the Xtra.Range Extender/Access point can be mounted for example on a fixture which is located on a building wall or on a pole. The fixture must provide a distance of at least 35cm between the Xtra.Range Extender/Access point and the wall.

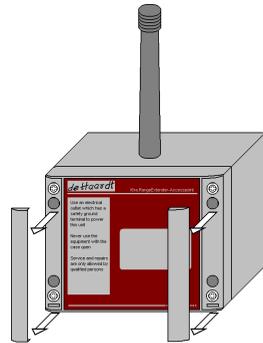


Always position the Xtra.Range Extender in such a way that the antenna is in vertically position and pointed to the sky.

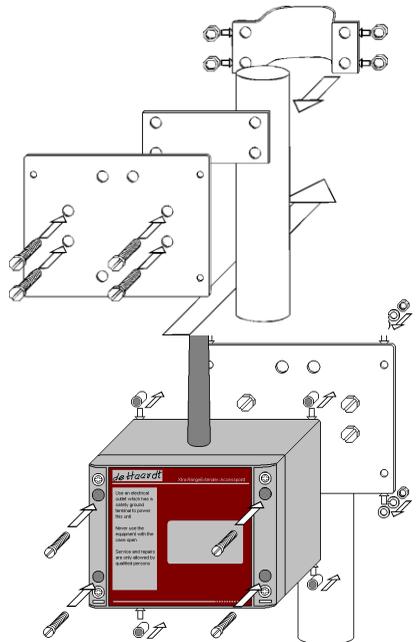
Guideline for mounting the Xtra.Range Extender/Access point on a pole (for illustration only):

Lift the plastic design covers of the Xtra.Range Extender/Access point from the aluminium housing.

The 4 fastening holes are now visible.
Note: It is not necessary to open the housing for mounting the unit!



Mount a baseplate to the support tube. This can be done by a bridge support. Use self locking nuts to prevent from loosening by vibration. A rubber sheet of around 5mm thickness can be used to prevent the baseplate from bending in case of tight tolerances between the tube diameter and bridge support.

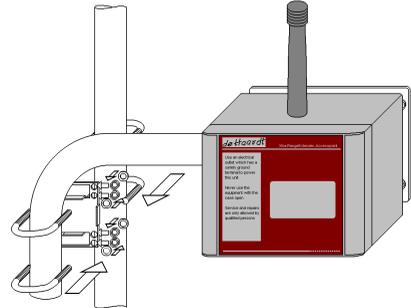


Fasten the Xtra.Range Extender/Access point on a baseplate with 4 screws (6mm diameter) and self locking nuts. Use spacers of around 10mm length between the Xtra.Range Extender and baseplate.

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After mounting the Xtra.Range Extender on the baseplate, put the plastic design covers back in place.

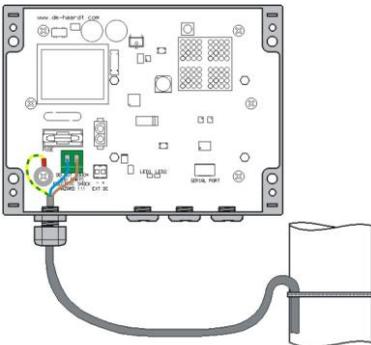
In case the support tube must be fastened to a pole, U-bolts in combination with a bridge support and self locking nuts can be used.



4.3.2 Electrical connections of the Xtra.Range Extender/Access point

The Xtra.Range Extender can be powered by:

- 230 Vac mains power supply
- 12 Volt DC supply, like a battery, solar panel or external dc supply.



Standard the Xtra.Range Extender is supplied with a 230V mains power cord.

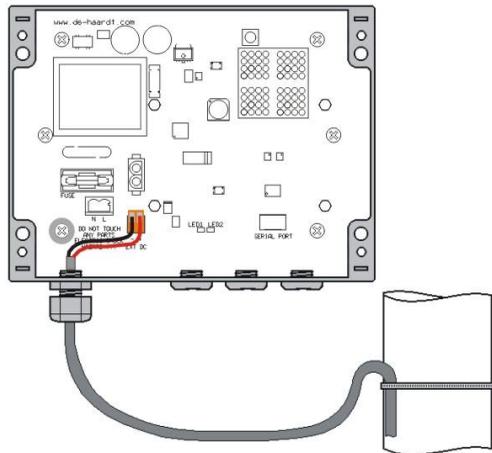
In case the unit must be powered by a 12 Volt DC supply, the main power cord has to be removed.

1. First disconnect the main power cord from the mains.
2. Open the Xtra.Range Extender/Access box, by loosening the 4 screws on the top.

3. Disconnect the green top connector of the power cord from the circuit board connector.
4. Loosen the 2 screws on the green connector on the cable.
5. Cut the Yellow-Green earth wire from the ring connector. Remove the remaining ring terminal out of the equipment housing. After removing the ring terminal fasten the circuit board again.
6. Loosen the gland and the power cord cable can be removed from the Xtra.Range Extender/Access point.

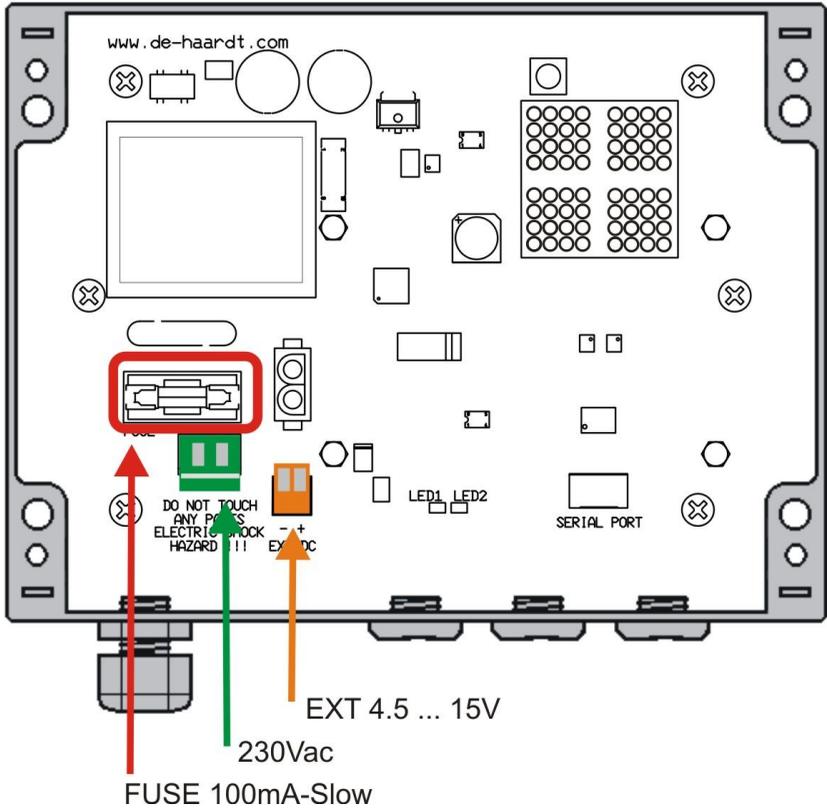
Once the power cord is removed, the 12 Volt supply cable can be inserted through the gland.

Connect the 12V cable to the 'EXT DC' connector on the circuit board. When the antenna is facing upwards, the left pin of the 'EXT DC' connector is the '-' (minus), and the right pin is the '+'.

**Important :**

In case of powering the Xtra.Range Extender / Access point by way of an external DC power source, the Xtra.Range Extender DC supply cable must be fused externally (500mA).

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4.4 Xtra.(warning) Light Control Board

The Xtra.Range Extender/Access point can be extended with a Light Control Board. By way of this board three 230V switched outputs are created which for example can be used to turn on and off start, stop and (sector) warning lights.

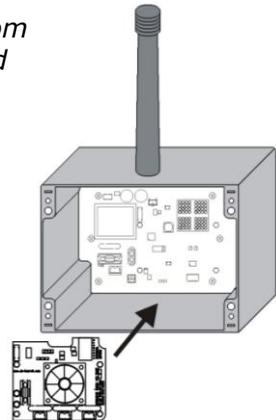
In addition the light control has 4 low voltage inputs (12 Volt), which can be used to externally control the lights. Also by way of advanced system configuration (not described in this manual) other functions can be assigned to the 4 inputs.

The Light Control Board can only control the three 230V switched outputs when the Xtra.Range Extender / Access point is powered by 230 Volt. If the board is only used as input device then it can also operate when the Xtra.Range Extender is powered by the external DC input.

4.4.1 Mounting the Light Control Board

Warning: *Disconnect all power sources from the Xtra.Range Extender / Access point and Light Control Board, when doing mounting and installation works!*

The Light Control Board can be mounted on top of the Xtra.Range Extender / Access point board. On the Xtra.Range Extender / Access point are 4 spacers mounted, on which the Light Control Board has to be installed.



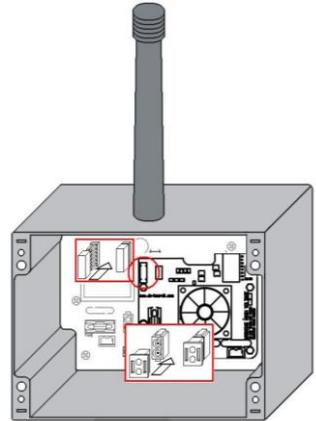
When positioning the Light Control Board on the Xtra.Range extender board, be sure that the pin header on the Range Extender board is on the same position as the connector on the backside of the Light Control Board.

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Fixate the light controller board with the 4 plastic screws.

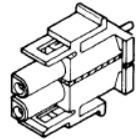
Do not apply excessive force since plastic screws are easily damaged.

After the Light Control Board is mounted on top of the Xtra.Range Extender / Access point board, connect the input power connector of the Light Control Board into the socket on the Range Extender / Access point board.

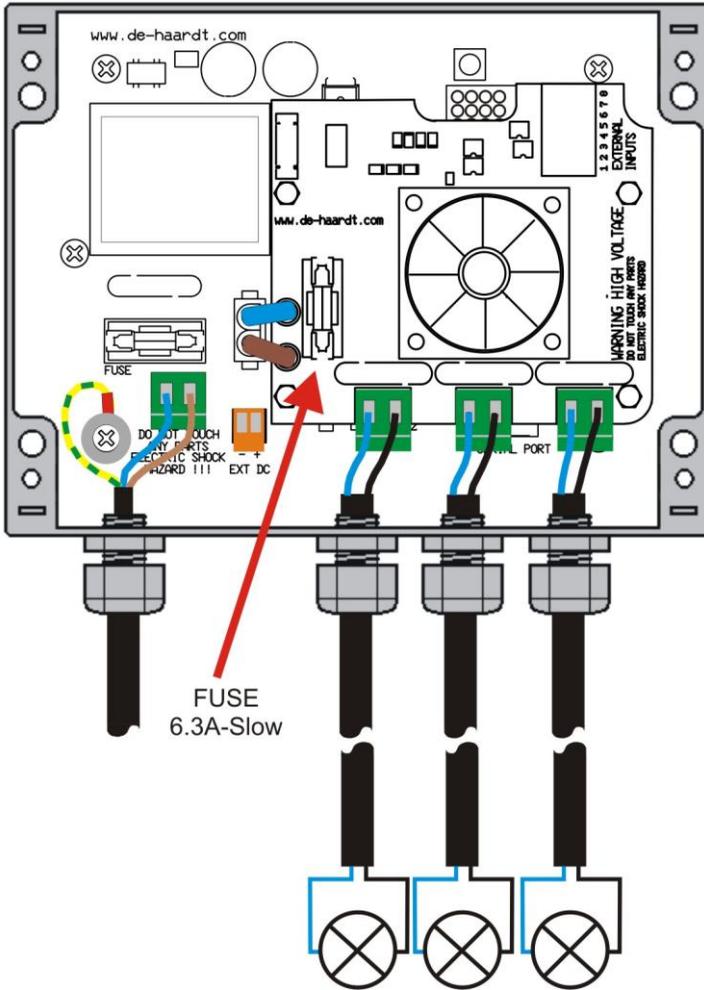


4.4.2 Wiring the Light Control Board

Once the Xtra.Light Control Board is installed, the white power receptacle has to be connected to the white power plug on the Xtra.Range Extender main board. This connector is located next to the fuse. The power connector has dual locking lances. Be sure these are latched when the board is installed.



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Wire color	Explanation
Blue	Neutral
Brown	Live (Phase)
Black	Switched Live (Phase)
Yellow-Green	Earth

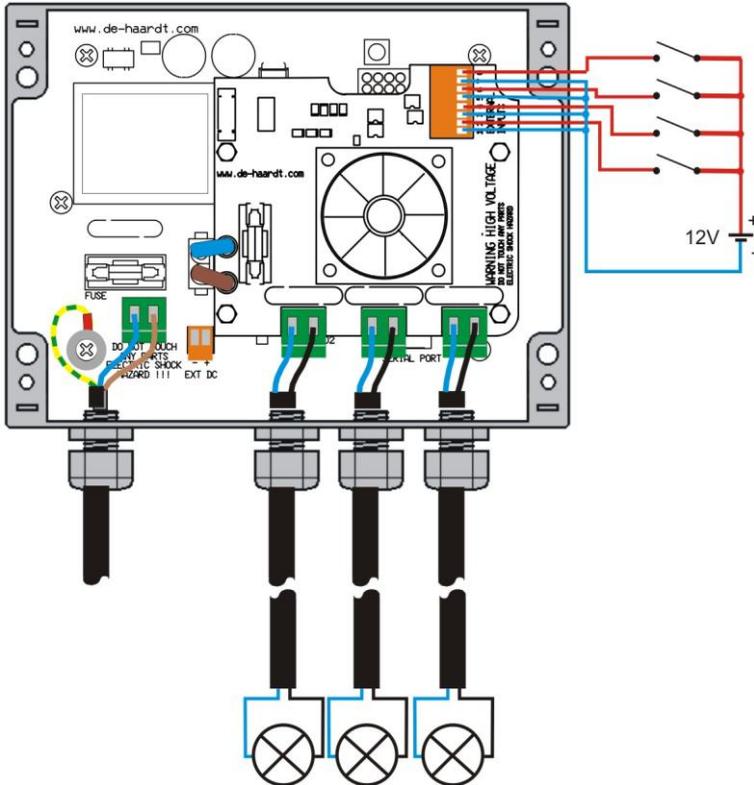
The Light Control Board is separately fused (6,3A/Slow). As illustrated above, there are individual connectors available on the Light Control Board for the 3 switched output channels.

Before starting the wiring, cable glands have to be screwed into the housing and securely fastened. Three M16x1.5 threaded holes are available for this purpose, which become visible after the blanking plugs are removed.

The M12x1.5mm threaded hole is available in case a cable must be connected to the control input of the Xtra.Light Control module.

The cable used to connect the switched output to the lights must at least be insulated and have a minimum of 1,0mm² conducted area. The cable also has to be at least rated for 300/500V, with a maximum length of 50 meters.

Manual Xtra.Remote Electric Kart & Track Control System



In the picture above there is given an example wiring for the 4 external control input signals. The table below describes the functions of the 8 pins of the external input connector.

External input pin	Description
1	(-) input 1 pin
2	(+) input 1 pin
3	(-) input 2 pin
4	(+) input 2 pin
5	(-) input 3 pin
6	(+) input 3 pin
7	(-) input 4 pin
8	(+) input 4 pin

Both external 12Vdc and 12Vac (50/60 Hz) input signals can be used for the input.

Use a multicore (Control) cable to connect the external inputs to the controlling device. This cable must have a voltage rating of at least 300 Volts, with a maximum length of 50 meters.

The controlling device must be isolated galvanically from the mains.

Important note:

All used cable glands must always provide fixation of the cable feedthrough up to a force of 60 Newton. Double check time after time during maintenance.

The clamp range of the 3 M16 glands is 5.5–9mm. For the M12 gland this range is 4–6 mm. Never feed through cables with different diameters.

Prevent damage to the feeded through cable caused by over fastening the dome nut on the gland body.

4.5 Xtra.Sector Control System

Using the Xtra.Sector Control System the speed of karts can be controlled in every section (zone) of the race track. In the case of an accident, the speed of the karts driving inside the dangerous zone is limited automatically. Once the karts are outside the dangerous section, the speed limit will be released.

The same system can be used for Pit-In and Pit-out speed control. Once a kart drives into the pit area, the speed is automatically reduced while the other karts on the track retain their normal speed. When a kart exits the pits, the speed is set to normal.

For circuits having 2 (or more) tracks which can be combined into one big track, the system can change the Track/Group settings of the Xtra.CDI Shutdown Transponder by simply driving a kart through the 'configuration sector'.

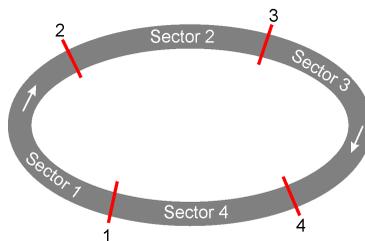
The Xtra.Sector Control System consists of one or more Xtra.Sector Beacon(s) placed along the track and Xtra.Sector Sensors mounted on every kart.

A wire is placed in a rectangular loop across the tarmac and attached to the Xtra.Sector Beacon. This loop marks the start of the sector. The loop/section number and function can be easily selected on the Xtra.Sector Beacon.

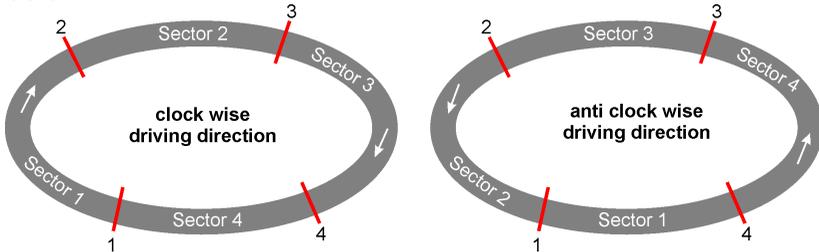
The Xtra.Sector Sensor is connected to the Xtra.CDI Shutdown transponder by means of the kart network port. Once the kart passes the loop, the intelligent Xtra.Sector Sensor processes the function received.

Track Sector numbering :

Every sector starts after passing the Xtra.Sector Beacon loop as illustrated below:



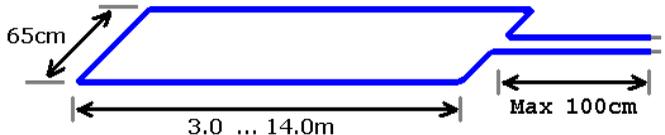
Sector numbering depends on driving direction as illustrated below:



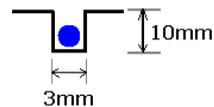
The Xtra.Sector Beacon can be configured for both driving directions, in case a separate "Driving Direction Unit" is used. As this unit normally is NOT supplied with the Xtra.Sector Beacon, this function is not further explained.

4.5.1 Electrical connection of the Xtra.Sector Beacon

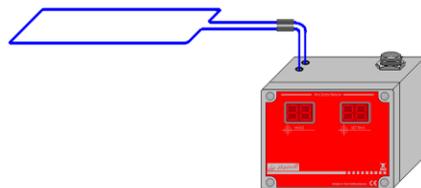
The LOOP wire is placed in a rectangular groove which is cut in the race track surface.



The 10mm deep by 3mm wide groove must ultimately be filled with silicon or another resin.



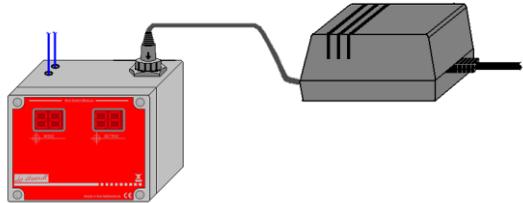
The ends of the LOOP wire must be attached (by soldering) to the 2 blue wires coming from the Xtra.Sector Beacon unit. Before soldering the loop wires, cut them to the required length and place the crimp sleeves.



Manual Xtra.Remote Electric Kart & Track Control System

Once the soldering is finished position the crimp sleeves over the solder connections and crimp the sleeves with a heat gun.

The power for the Xtra.Sector Beacon is provided by an external adapter.



Push the adapter power plug completely into the socket on the Xtra.Sector Beacon. Once the plug is put correctly into the socket, fasten the plug with its locking screw. Once locked, the connection is water resistant.

Warning: Keep unplugged connectors (both sockets and plugs) completely dry and clean. Never expose them to water, fuel, oil, chemicals or any kind of dirt!

Warning: The adapter itself is NOT waterproof and not intended for outside use. In case the Xtra.Sector Beacon system must be used outside, the adapter needs additional protection.

The Xtra.Sector Beacon itself is 100% waterproof once the power plug is connected conform instructions.

4.5.2 Mounting of the Xtra.Sector Sensor

Every kart requires its own Xtra.Sector Sensor.

It is essential that the Xtra.Sector Sensor is installed according to the descriptions below, otherwise performance problems or even damage can be expected.

The most important rules of installation are:



- The maximum distance between the loop antenna and the housing of the Xtra.Sector Sensor is 20 cm.
- For best performance the Xtra.Sector Sensor must be mounted flat on the karts plastic floor plate in line with the driving direction (printed arrow points to the driving direction). Aluminum floor plates may reduce performance.
- Keep the Xtra.Sector Sensor as far as possible away from tubes, iron or other electric conducting materials and the karts high current conducting cables.

It is advisable to first connect the Xtra.Sector Sensor to one kart only, then test if it performs properly, and continue to mount the timing transponders to all other karts.

The fixation of the Xtra.Sector Sensor can be done with 3 screws.

4.5.3 Electrical connection Xtra.Sector Sensor

On the kart, the Xtra.Sector Sensor must be connected to the Xtra.CDI Shutdown Transponder through the network port.



The network port is protected with a rubber cap normally. This rubber cap has to be removed before the network connector can be attached. Check the polarisation before fitting the connector!

**Manual Xtra.Remote Electric
Kart & Track Control System**

Once attached double check the coupled connectors and make 100% sure that vibration cannot loosen the connection.

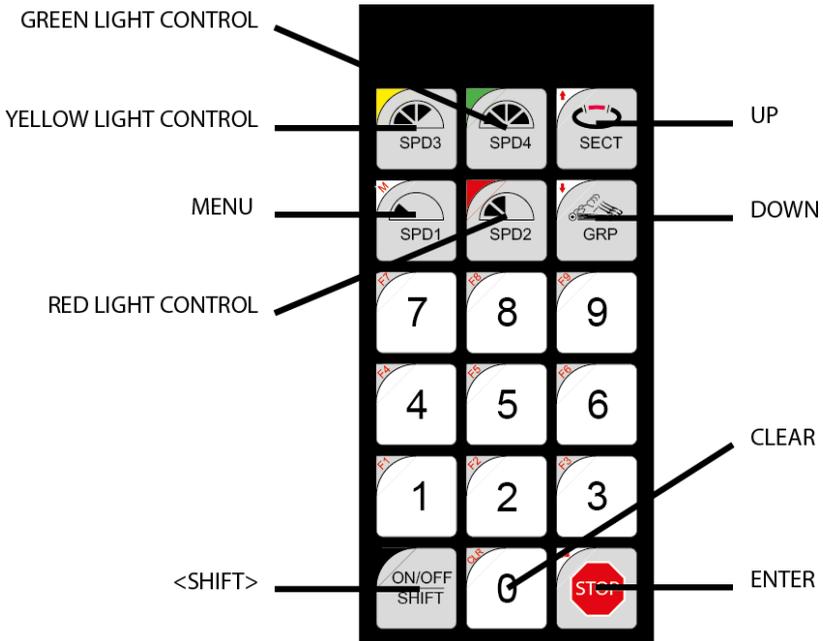
Warning: Keep unplugged connectors (both sockets and plugs) completely dry and clean. Never expose them to water, fuel, oil, chemicals or any kind of dirt!

Warning: Make 100% sure that vibration can NOT loosen the network connection as this can cause several problems like bad functioning of the system, corrosion of the network plug and socket, etc..

5 Operating the equipment

5.1 Button functions and basic operation of the Xtra.Remote Control

5.1.1 Switching the Remote Control On/Off



Press the **ON/OFF** button on the keyboard of the Xtra.Remote Control for at least one second to turn the device on. Once on, you can do the same to turn it off.

5.1.2 Indirect stop of all karts at once

By pressing the **SHIFT** button followed by the **STOP** button, all karts can be stopped at once.

If required, the remote can be programmed in such a way that this function can be executed by pressing the **STOP** button only.

Please follow the instructions at paragraph 5.2.7

5.1.3 Adjusting the speed of kart(s)

On the remote control there are 4 buttons for reducing the speed of the kart(s). These buttons are: **SPD1**, **SPD2**, **SPD3**, **SPD4**.

Button **SPD1** (Speed 1) is meant for the lowest speed, and **SPD4** (Speed 4) for the highest speed.

These speed limits are default set to the following limits:

SPD1 – RPM 2100

SPD2 – RPM 3000

SPD2 – RPM 4000

SPD4 – RPM no limit

If required the RPM settings can be changed according to your own requirements.

Please follow the instructions at paragraph 5.2.8

5.1.4 Adjusting the speed of an individual kart

The speed of individual karts can be adjusted in 2 ways:

1. By entering the serial number of the Xtra.CDI Shutdown Transponder mounted on the kart concerned, followed by pressing one of the SPD buttons.
2. By entering the kart number (with the custom assigned kart number by means of *Menu->Shutdown tp->Assign*), followed by pressing one of the SPD buttons.

50

Serial numbers range from 65536 to 1048575.

Kart numbers range from 1 to 245.

5.1.5 Adjusting the speed of a group of karts

Before this function can be used, the user must assign (one time only) group number(s) to the Xtra.CDI Shutdown Transponder first. This can be done with "*Menu->Shutdown tp->Assign*".

The speed of a group of karts can be adjusted by pressing the group number followed by pressing **GRP** and **SPD**.

Group numbers range from 1 to 5.

5.1.6 Adjusting the speed of all karts at once

Press one of the **SPD** buttons without a preceding number.

5.1.7 Adjusting the speed in multiple sectors

To be able to use this possibility, the kart must be fitted with a sector sensor which is connected to the Xtra.CDI Shutdown Transponder through the network. Also the track has to be subdivided into sectors using the Sector Beacon System.

To adjust the kart speed in a sector, press the sector number followed by the **SECT** button, and finally the **SPD** button.

To adjust the speed in several succeeding sectors, press the first sector number followed by the **SECT** button. Then press the last sector number followed by the **SECT** button and finally press the **SPD** button.

If a kart number is entered before pressing the **SPD** button, then the speed of only that individual kart will be adjusted when driving inside the entered sectors.

It is also possible to adjust the speed of a certain group of karts in one or more sectors. In this case enter the group number followed by the **GRP** button before the **SPD** button is pressed.

5.1.8 Penalties

Penalties (speed limitation for a short time) can be given to an individual kart, a group of karts or all karts.

In case the 0 button is pressed first, followed by pressing the regular speed reduction buttons, the penalty function is selected. As soon as the last button is pressed, the display indicates (P) to indicate the penalty.

Refer to 'Menu->Remote->Penalty Time' to setup the penalty time.

5.1.9 Adjusting the speed in steps

The speed of the karts can be increased/decreased step wise. To increase the speed with a step, press the **SHIFT** button, followed by the **UP** button.

To reduce the speed with a step, press the **SHIFT** button followed by the **DOWN** button.

The karts to which the command applies are taken over from the last entered speed command.

5.1.10 Repeating last command

To repeat the last speed command, press the upper right button **SECT**.

5.1.11 Operating (race) lights

Default the Xtra.Remote control can operate the Red, Yellow and Green (race) lights.

To operate the Red lights	press: SHIFT SPD2
To operate the Yellow lights	press: SHIFT SPD3
To operate the Green lights	press: SHIFT SPD4

The selected light menu appears, and by pressing 1, 2 or 3 you can turn On, Off or toggle the light

5.2 Menu functions

By pressing the **SHIFT** button followed by the **MENU** button, the MAIN MENU of the Xtra.Remote Control appears.

With the **UP** and **DOWN** button it is possible to scroll through the menu. With the **ENTER** button an item can be selected.

By pressing the **SHIFT** and **CLR** button you can leave the menu at all time.

In the MAIN MENU, all the components of the Xtra.Remote kart and track Control system which can be configured by means of the Xtra.Remote Control, are displayed.

5.2.1 Menu->Remote->Track

By means of this menu the circuits (TRACKS) can be turned On or Off to which this remote control is part of.

The circuits are indicated with the characters A, B, C and D.

With the **UP** and **DOWN** button you can scroll through the menu and with the **ENTER** button the circuit can be turned On or Off.

It is possible to use the remote control on several circuits simultaneously.

5.2.2 Menu->Remote->Brightness

The brightness of the display can be adjusted by selecting this item from the menu.

5.2.3 Menu->Remote->Backlight

The backlight of the remote is normally disabled. By means of this menu this can be turned on.

Since the backlight of the LCD consumes relatively much energy, for mobile use (battery operated) it is advised to turn off the backlight.

5.2.4 Menu->Remote->Power Save

The Xtra.Remote Control is able to shut itself down when in idle state for a certain time. In this menu you can configure the time before the Xtra.Remote Control turns itself off.

5.2.5 Menu->Remote->Penalty Time

One of the 4 displayed penalty times can be chosen in this menu.

With the **UP** and **DOWN** button you can scroll through the menu and with the **ENTER** button one of the penalty times can be selected.

5.2.6 Menu->Remote->Power Info

In this menu the total battery voltage and the internal adapter voltage can be examined.

5.2.7 Menu->Remote->Direct stop

In this menu you can choose to operate the Direct Stop function by just pressing the **STOP** button only.

With the **UP** and **DOWN** button you can scroll through the menu and with the **ENTER** button the direct stop function can be turned On or Off.

If turned On, the Direct stop function is activated.
If turned Off, the Indirect stop function as described in paragraph 5.1.2 is activated.

5.2.8 Menu->Remote->RPM settings

In this menu you can choose to adjust the preset speed limits according to your own requirements.

Choose the speed number you want to change by using the **UP** and **DOWN** button.

1. The maximum RPM is configured by pressing the numerical buttons. If you want to delete a number press **SPD3**.

RPM limit ranges from 1600 to 6500 RPM
RPM no limit can be chosen by pressing **SPD4**
button

Scroll to the **[NEXT]** item and press the **ENTER** button, to store the settings in the Remote Control.

5.2.9 Menu->Shutdown tp->Assign

In this menu you can assign a kart number, a group number(s) and different tracks to the Xtra.CDI Shutdown Transponder.

After entering the serial number of the Xtra.CDI Shutdown Transponder, all the current settings are loaded from the Xtra.CDI Shutdown Transponder into the Remote Control and shown on the display.

The loaded settings can now be modified by scrolling through the listed items (**UP** and **DOWN** buttons).

1. Kart numbers are entered by pressing the numerical buttons, if you want to delete a number press **SPD3**
2. Group numbers are toggled by pressing the buttons 1 to 5 and the display shows the currently selected group numbers.
3. Circuits/Tracks are toggled by pressing the buttons 1 to 4 (1 is Track A, 2 is Track B.....). The display shows the currently selected tracks. At least 1 track/circuit has to be selected.

Scroll to the [**NEXT**] item and press the **ENTER** button, to upload the settings to the Xtra.CDI Shutdown Transponder.

5.2.10 Menu->Shutdown tp->Read timer

By entering the kart or serial number of the Xtra.CDI Shutdown Transponder you can read out the running time of that kart.

5.2.11 Menu-> Shutdown tp->Reset timer

By entering the kart number or the serial number of the Xtra.CDI Shutdown Transponder the running time counter can be reset to zero.

5.2.12 Menu->Shutdown tp->Read RPM

By entering the kart number or the serial number of the Xtra.CDI Shutdown Transponder you can read out the RPM of the kart engine addressed.

5.2.13 Menu->Shutdown tp->RPM Limits

By entering the serial number of the Xtra.CDI Shutdown Transponder you can configure the RPM limit of the kart.

1. The maximum RPM is configured by pressing the numerical buttons. If you want to delete a number press **SPD3**.

RPM limit ranges from 1600 to 6500 RPM

2. The brake switch RPM limit is configured by pressing the numerical buttons. If you want to delete a number press **SPD3**.

The brake switch RPM limit ranges from 1600 to 6500 RPM

Important :

Due to the nature of limiting the speed by way of spark suppression, fluctuations in speed can occur once the speed is limited. Therefore we do not suggest to use this function to equalise (maximum) speeds between karts, or activate this function during (official) timed races or important events.

5.2.14 Menu->Range Extend->Track

After entering the serial number of one of your Range Extender / Access points, a track list is shown. A marked track means that the Range Extender is listening to commands of that track. By selecting the desired track and pressing the **ENTER** button, the selection can be toggled.

In the 'Range Extension' field of the menu, the Range Extender function of the unit can be enabled/disabled.

To store the setting to the Range Extender, you have to set the marker to the Store field and press **ENTER**.

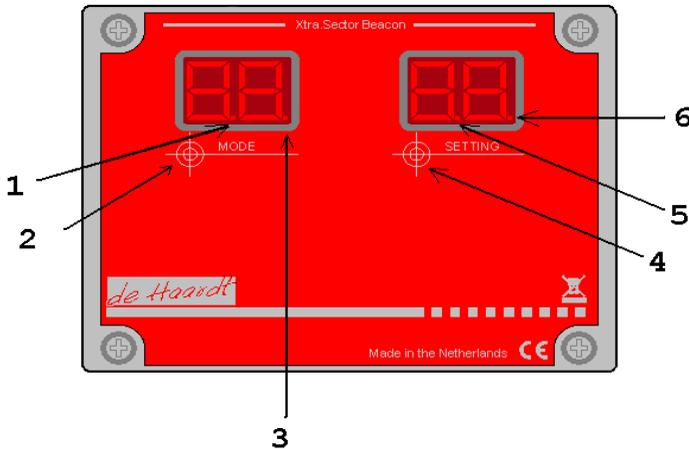
5.2.15 Menu->Range Extend->Link Check

To check if a Range Extender can 'see' another Range Extender, enter the serial number in the **To** and **From** fields and press **ENTER**.

The results are shown on the display.

5.3 Configuration of the Sector beacon

The Xtra.Sector Beacon can be configured by using the 'magnetic tip pen' on the front panel of the unit.



Number	Explanation
1	The DOT indicates that the internal MODE switch is activated by the 'magnetic tip pen'.
2	The CROSS indicates the position to put the 'magnetic tip pen' for changing MODE.
3	This DOT indicates the driving direction. When turned off, the default driving direction is selected. When turned on, the reverse driving direction is selected.
4	The CROSS indicates the position to put the 'magnetic tip pen' for changing SETTING.
5	The DOT indicates that the internal SETTING switch is activated by the 'magnetic tip pen'.
6	This DOT indicates the driving direction. When turned off, the default driving direction is selected. When turned on, the reverse driving direction is selected.

Every time the 'magnetic tip pen' is held near the MODE cross (2), the next mode is shown on the left part of the display.

Meaning of the 2 displayed Mode characters is described in the table below.

Mode	Description
Sn	Sector number
Fn	Function number
Ad	Address
Er	Error number

After selecting a mode, keep the 'magnetic tip pen' near the SETTING cross (4) until the digits start blinking.

Once the SETTING digits are blinking, the value can be changed by holding the 'magnetic tip pen' near the SETTING cross (4).

The new value can be stored by keeping the 'magnetic tip pen' for more than 1 second at the MODE cross (2).

5.3.1 Mode -> Sector number

Every Xtra.Sector Beacon loop can be used to mark the start of a new sector on the track. Sector numbers range from 0 - 31.

In case sector number 0 is selected, the Xtra.Sector Beacon is put in standby mode. The result is that the Xtra.Sector Sensor will ignore all Xtra.Sector Beacon commands. Only the Led indicator on top of the Xtra.Sector Sensor flashes for diagnostic purposes.

5.3.2 Mode -> Function number

A function can be assigned to every Xtra.Sector Beacon loop. Functions are numbered and range from 0 - 63. The table below describes valid functions.

Function number	Details
0	No function, default value for Sector Speed Control
<i>Limit the speed of the kart when passing the beacon LOOP:</i>	
10	STOP the kart when passing the Xtra.Sector Beacon LOOP.
11	LIMIT kart speed to SPEED1 level (Advised for PIT-IN)
12	LIMIT kart speed to SPEED2 level when passing the beacon LOOP.
13	LIMIT kart speed to SPEED3 level when passing the beacon LOOP.
14	LIMIT kart speed to SPEED4 level when passing the beacon LOOP. (Advised for PIT-OUT)
<i>Configuration functions for the Xtra.CDI Shutdown Transponder:</i>	
20	Configure Xtra.CDI Shutdown Transponder for Group number 1.
21	Configure Xtra.CDI Shutdown Transponder for Group number 2.
22	Configure Xtra.CDI Shutdown Transponder for Group number 3.
23	Configure Xtra.CDI Shutdown Transponder for Group number 4.
24	Configure Xtra.CDI Shutdown Transponder for Group number 5.
25	Configure Xtra.CDI Shutdown Transponder for Track A
26	Configure Xtra.CDI Shutdown Transponder for Track B
27	Configure Xtra.CDI Shutdown Transponder for Track C

Function number	Details
28	Configure Xtra.CDI Shutdown Transponder for Track D

Function numbers not mentioned above are reserved for future purposes.

5.3.3 Mode -> Address

The Xtra.Sector Beacon address ranges from 0 - 63 but is required only for special applications. Therefore this item is not further explained and the selected value is of no importance.

5.3.4 Mode -> Error

The Xtra.Sector Beacon tunes the loop at power-up. If the Xtra.Sector Beacon detects problems while tuning the loop, an error number is shown on the display. To reset an error, turn the unit off and on again.

Error number	Diagnostic result
0	No error
1	Loop not connected
2	Loop too long
3	Loop too short

5.4 Operating the Xtra.Sector Sensor

The LED indicator on top of the Xtra.Sector Sensor gives diagnostic information when passing an Xtra.Sector Beacon loop as shown in the table below.

Number of flashes	Diagnostic result
1	Bad reception or faulty data received
2	Reception acceptable
3	Reception good

6 WEEE Legislation

European Directive 2002/96/EC requires that the equipment bearing this symbol on the product and/or its packaging must not be disposed of with unsorted municipal waste. The symbol indicates that this product should be disposed of separately from regular household waste streams. It is your



responsibility to dispose of this and other electric and electronic equipment via designated collection facilities appointed by the government or local authorities. Correct disposal and recycling will help prevent potential negative consequences to the environment and human health. For more detailed information about the disposal of your old equipment, please contact your local authorities, waste disposal service, or the shop where you purchased the product.

7 Declaration of Conformity

We, the undersigned,

Company: De Haardt Electronic Engineering BV
Address: Marithaime 6
6662 WD, Elst (GLD)
Country: The Netherlands

declare that the following equipment :

Xtra.CDI Shutdown Transponder
Xtra.Twin Shutdown Transponder
Xtra.Remote Control
Xtra.Range Extender / Access point
Xtra.Light Control Board

is in conformity with the following standards :

EN 300 220-3 V1.1.1 (September 2000)
EN 301 489-1 V1.4.1 & EN 301 489-3 V1.4.1 (August 2002)
IEC 60950-1:First edition 2001-10
EN 60950-1:2001, including amendment A11:2004

And therefore complies with Directive 89/336/EEC &
73/23/EEC of the European parliament.

Date: 25-10-2005
Drawn up in: Elst (GLD), The Netherlands
Name: J. de Haardt
Signature:



8 Technical specification

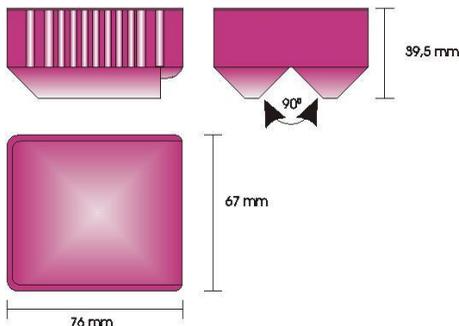
8.1 Xtra.Remote Control



Dimensions	LxWxH = 172x77x25 mm (without antenna)
Maximum number of karts	Unlimited, 245 custom assignable (short) kart numbers
Keyboard	Membrane with tactile feedback
Display	Graphic LCD, with backlight
Radio technology	2 way communication
Battery standby time	96 hours
Battery operation time	16 hours
Charge time	16 hours
Buzzer	Integrated
Power supply	<ul style="list-style-type: none"> • Mains adapter • Batteries
Batteries	2 x High capacity Rechargeble Ni- MH, size AA, min 2100 mAh
Battery charger	Integrated
PC connection	RS-232 port
Humidity	Max 85% relative
Traffic , Race light Control	Yes
Speed select buttons	SPD1, SPD2, SPD3, SPD 4 and STOP
Number of tracks to be controlled	4
Brightness control	Yes, multiple levels
Backlight modes	10s, 30s, off
Power save	Automatic 30s, 1m, 5m, off
Diagnostics functions	Available
Stepwise speed control	Yes, by UP and DOWN buttons
Battery voltage meter	Available
Penalties	4 penalty times can be setup. Penalty speed limit can be selected out of the 4 speed limits.
Software upgradable	Yes
Carriage bag	Available
Weight	Approx. 290 grams
Temperature Range	-10 to +55 Degrees Celsius

Enclosure	Mountable on round and square tubes, supported with tie-wrap feeds
Weight	Approx. 200 grams
Temperature range	-10 to +55 Degrees Celsius

8.2 Xtra.CDI Shutdown Transponder



Dimensions	LxWxH = 76x67x39.5 mm
Antenna	Integrated
Maximum number of karts	Unlimited, 245 custom assignable (short) kart numbers
Maximum number of groups	5 custom assignable group numbers
Maximum number of tracks	4 custom selectable
Engine Shutdown	Yes
Operating principle	Spark cancellation
Speed operating range	1600 – 6500 RPM
Radio technology	2 way communication
Brake switch	Limits the speed to customized preset value when the brake switch is activated
Network	By means of the network connection, (future) units on karts can mutually communicate
Tachometer	Real time readable with the Xtra.Remote Control

Motor type	Honda GX engines (35,120,160,200, 270 and 390)
Power supply	Depending on the engine type: - Directly from ignition (non-CDI) - 12V battery - Xtra.Universal Power Coil
Engine running time counter	Real time readable with the Xtra.remote control
Kart type	Single engine available only
Enclosure	Mountable on round and square tubes, supported with tie-wrap feeds
Weight	Approx. 200 grams
Temperature range	-10 to +55 Degrees Celsius

8.3 Xtra.Range Extender / Access point

Dimensions	LxWxH = 180x148x91 mm (without antenna)
Power supply	<ul style="list-style-type: none"> • 230 V AC (+10 ... -15%) , 50-60 Hz • 4.5 - 15V DC (Outputs of the Light Control Board can NOT be used)
Radio technology	2 way
Enclosure	Die-cast IP65
Range extender	Enabled / disabled 4 tracks, can be individually enabled/disabled
Warning messages	Low battery detect warning
Access point interface	RS-232
Rated temperature range	-10 to +50 Degrees Celsius (without Light Control Board installed) -10 to +40 Degrees Celsius (with Light Control Board installed)

Maximum Current from mains	6.3 Amps, with Light Control Board is installed. 0.1 Amps, without Light Control Board installed.
Maximum current external DC port.	250 mA.
Software upgradable	Yes
Weight	Approx. 1650 grams

8.4 Light Control Board

Outputs	3 channels (Mains switches)
Output light patterns	<ul style="list-style-type: none"> • Continuous on • Continuous off • Blinking on/off (Blinking time 20 to1000 mSec) <p>Configurable for each output channel individually</p>
Maximum total output current	6.3 Amp
Maximum individual output current	4 Amp
Inputs	4 galvanic isolated 12 volt inputs. Both ac and dc voltages can be used
Input trigger	<ul style="list-style-type: none"> • Rising edge • Falling edge • Positive level • Negative level
Fuse	6.3 A / Slow (20mm)
Power source	Internally from Xtra.Range Extender / Access point.
Temperature range	-10 to + 40 Degrees Celsius
Weight	Approx. 100 gr

8.5 Xtra.Sector Beacon

Dimensions	LxWxT = 116x91x81 mm
Display type	LED
Functions	User selectable : <ul style="list-style-type: none"> • Sector Speed control • Limit SPEED to 2100 RPM • Limit SPEED to 3000 RPM • Limit SPEED to 4000 RPM • Limit SPEED to 0 RPM (STOP) • No SPEED limit • SET Xtra.CDI Shutdown transponder to Track A, B, C or D • SET Xtra. Shutdown transponder to Group 1, 2, 3, 4 or 5
Maximum number of Sectors	31
Functions	User selectable using 'Magnetic Tip Pen'
Sector numbering	<ul style="list-style-type: none"> • Clock wise • Anti clock wise (Switchable using 'Driving Direction Unit')
Xtra.Sector Beacon Power supply	<ul style="list-style-type: none"> • 12V DC through 8p- MINI DIN waterproof connector. • Mains adapter is supplied with system.
Interface port	RS-485 through 8p- MINI DIN waterproof connector
Software upgradeable	Yes
Weight Xtra.Sector Beacon	Approx. 420 grams
Weight adapter	Approx. 875 grams
Temperature range	-10 to +55 Degrees Celsius

8.6 Xtra.Sector Sensor

Dimensions	LxWxT = 67/88x49x23 mm
Mounting direction	Horizontal, in line with driving direction
Max mounting height	20 cm ^{*1}
Cable length	Approx. 75 cm.
Indicator	LED
Enclosure	Screw mountable
Communication	By means of the kart network port
Power supply	Via (kart) network port
Power backup	Internal Lithium battery
Software upgradeable	Yes
Weight	Approx. 115 grams
Temperature range	-10 to +55 Degrees Celsius

*1 : *With no magnetic absorbing material between Xtra.Sector Sensor and the track loop.*

9 Warranty

1. De Haardt Electronic Engineering BV guarantees for 12 months after delivery of the goods sold or provided for use that:
 - the goods can perform the tasks stated in the manuals, descriptions and documentation;
2. The liability under the guarantee contained in this article is limited at De Haardt Electronic Engineering BV's choice to remedying material and manufacturing faults free of charge in De Haardt Electronic Engineering BV's own workshop, supplying new parts free of charge and taking back and acquiring the ownership of the non-functioning parts, or applying a price reduction by agreement with the other party on the goods supplied or provided for use. De Haardt Electronic Engineering BV cannot under any circumstances be obliged to come to the location of the delivered goods to establish defects claimed by the other party. Equally, De Haardt Electronic Engineering BV cannot be compelled to carry out repair work outside its own workshop.
3. The guarantee referred to in the third paragraph does not cover the costs of disassembly, labour costs, transport costs and call-out charges, all in the most general sense. These costs will be charged in all cases.
4. No guarantee is provided if:
changes have been made to the goods supplied by or provided for use by De Haardt Electronic Engineering BV other than by De Haardt Electronic Engineering BV itself or persons expressly authorized by De Haardt Electronic Engineering BV, unless De Haardt

Electronic Engineering BV has agreed in writing to such changes in advance;
the defects in the goods supplied or provided for use by De Haardt Electronic Engineering BV are the result of:
neglect of the maintenance of the goods supplied or provided for use by the other party or other users;
improper use or use not in accordance with the instructions supplied by De Haardt Electronic Engineering BV for the installation of the goods;
incompetent use and/or misuse of the goods supplied or provided for use by the other party or other users;
wear and tear;
repairs or replacements carried out by persons other than those expressly authorized to do so by De Haardt Electronic Engineering BV, unless De Haardt Electronic Engineering BV has agreed in writing to such repairs or replacements in advance

5. Work not covered by the guarantee as referred to in this article shall be charged to the other party in accordance with De Haardt Electronic Engineering BV's relevant current tariffs.
6. Notwithstanding the provisions in the preceding paragraphs, the guarantee provided by De Haardt Electronic Engineering BV does not go beyond any guarantee provided to De Haardt Electronic Engineering BV by the relevant manufacturer or supplier of the hardware and/or software and fulfilled in respect of De Haardt Electronic Engineering BV. De Haardt Electronic Engineering BV shall on the other party's request inform the latter of the content of the contracts entered into between De Haardt and its suppliers.