

Regulations of the International Educational Meeting e-Kart 2014

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Section 1 - Definition of the Meeting e-Kart 2014

Article 1.1 Definition

The Vierzon International Pedagogical Meeting of Electric Kart e-Kart 2014 is a friendly meeting of students and teachers who worked on an electric vehicle. It is by no means a competition. The main objective of this event is the exchange of experiences of each in a friendly atmosphere.

Article 1.2 Dates

The meeting e-Kart 2014 will take place from Thursday, May 22, 2014 at 9:00 Saturday, May 24, 2014 21:00. It will be possible to carry out storage Sunday, May 25, 2014 until 11:00.

Article 1.3 Place

The meeting e-Kart 2014 will take place on the track karts installed on the parking lot of the Parc des Expositions of the city of Vierzon, Place de la Libération, 18100 Vierzon, France.

The meeting e-Kart 2014 takes place in the Crossroads of Technology and Innovation Cartec Inno 2014, in parallel to the Festival of Robotics IUT GEII 2014.

Article 1.4 Safety regulations

Participants in the meeting e-Kart 2014 attest to having read the rules specific track and meeting educational, as well as the safety instructions contained in the safety briefing.

Article 1.5 Organization

Meeting the e-Kart 2014 is organized by the e-Kart Association and ASTECH:

- 1) The e-Kart Association - Director: Thierry Lequeu
152, rue de Grandmont - 37550 Saint Avertin - France
Mobile: 06 89 73 80 58
E-mail: [thierry.lequeu @ gmail.com](mailto:thierry.lequeu@gmail.com)
Website: <http://www.e-kart.fr>
- 2) ASTECH Association - Director: Michel AUFAUVRE
Maison des Cultures Professional - 18100 Vierzon - France
Website: <http://www.CARTEC-inno.com>

Article 1.6 Websites

The website of the e-Kart Meeting 2014 is at <http://www.e-kart.fr/2014/> .

The website Cartec Inno 2014 at <http://www.cartec-inno.com/> .

Article 1.7 Registration fee per person

Registration for the 2014 Meeting e-Kart is by contacting Thierry Lequeu by mail to:
thierry.lequeu@gmail.com

and until Friday, February 14, 2014 for a normal rate.

Registration fees are automatically calculated from the number of kart (s) registered (s), the number of meals and overnight stays. Meals are required in the registration form.

From 15 February 2014, the fee is increased by 1% per day of delay.

In case of cancellation before Friday, March 28, 2014, 50% of registration fee will be refunded.

After March 28, 2014, no entry fee will be refunded and the bill is due.

The deadline for registration is Friday, March 28, 2014.

Based formulas chosen entries cover the costs of accommodation (hotel, 2-4 persons per room) for the night of Thursday, May 22, 2014, from Friday, May 23, 2014 and Saturday, May 24, 2014 (optional), and meals from dinner on Thursday evening May 22, 2014, breakfast + lunch and evening of Friday, May 23, 2014 and lunch on Saturday, May 24, 2014. The evening meal on Saturday, May 24, 2014, the night of Saturday, May 24, 2014 to Sunday, May 25, 2014 and breakfast on Sunday, May 25, 2014 are optional.

Participants have the opportunity to make their specialty area within the test of "Buffet Gaulois" after the evening meal on Thursday, May 22, 2014.

Article 1.8 Registration forms and identification forms of the kart

Each participant will have to complete a registration form of a computer file type Microsoft OFFICE WORD 2003. The photo should allow easy identification of the participant (recent color photo). Essential information's are: NAME, First Name, date of birth, photo, phone number, and e-mail.

The file name should include the number of the team this year, the NAME of the person and his name, for example "-2014-37H-Lequeu Thierry.doc." This allows the automatic classification of files.

For minors, permission to participate in the Meeting e-Kart signed by parents must also be provided. This document will allow medical intervention in case of an incident or accident.

The same applies to the information sheet of the kart, the photo must be recent and match this to the kart Meeting e-Kart 2014.

The deadline for receipt of registration forms and details of the kart is fixed on Monday, March 21, 2014.

Article 1.9 Insurance

The kart must be insured as a recreational vehicle motor (green card).

Students must have a certificate of liability under the covering educational activities.

The e-Kart Association, co-organizer of the meeting e-Kart 2014, take out a specific insurance to cover the event with the MAIF company.

Article 1.10 Collection of photos and videos

The IT department of the organization of the Meeting e-Kart 2014 collects photos and videos made by different teams.

The deadline for receipt of photos is set for Friday, June 7, 2013

At the following address: Thierry Lequeu – 152, rue de Grandmont – 37550 Saint Avertin – France.
One or more DVD of the Meeting e-Kart 2014 will be made after the event.

Article 1.11 Building a team

A team is composed of 0-5 teachers and/or personal coaching and 1-30 students.

The team has to get team name.

A team leader should be appointed.

The team has only one kart (how many teams as karts).

Article 1.12 Security circuit breaker

A security circuit breaker is required for registration and authorization driving karts present at the electric kart Meeting e-Kart 2014. This point will be checked during the technical inspection of the kart.

The system must switch off the power relay and / or the drive power supply.

It must be installed in the pilot's left, right hand raised for reporting an incident or a reduced speed during reentry into the stands.

A fastening system scratch tape will be provided by the organization for the connection between the cord and the left wrist of the driver.

Association G.E.S.I. donates the security circuit breaker for competitors of the Meeting e-Kart 2014. The teams are listed on the e-Kart 2014 Meeting receive a circuit breaker machine. In case of problems contact Thierry Lequeu by mail to:

thierry.lequeu@gmail.com



Article 1.13 Numbering kart

The kart will wear his number legibly on the front panel nostril on the two sides and rear. The kart number is the number of the team, 37H, for example, if there is only one kart. It is followed by a number if there are several karts in the team: 37H1 and 37H2.



The nassau panel



On pontoons



On the rear panel of the kart

Article 1.14 Different kind of charging plug

1.14.1 Connecting the 48V 50A SPEEDOMAX charger



The sockets are asymmetrical and have a flat face. For mounting on the LEFT side of the kart (rear view in the direction of travel), the positive terminal 48 V is found in UP side, and the auxiliary contact. The negative-0V is found in LOW side.

The auxiliary contact is to be connected to ground so that the SPEEDOMAX charger can work.

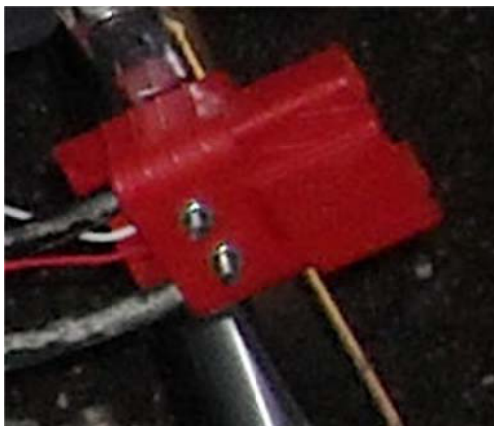
When the plug of the charger is plugged into the LEFT side of the kart (rear view in the direction of travel), the positive terminal 48 V is found in LOW side, and the auxiliary contact. The negative-0V is found in UP side. The handle can be found outside.

1.14.2 Branchement des chargeurs ZIVAN 48V 100A

The REMA 160A plus are used to connect three-phase ZIVAN 48V 100A power chargers.



1.14.3 Power outlet 72V Lithium ANDERSON

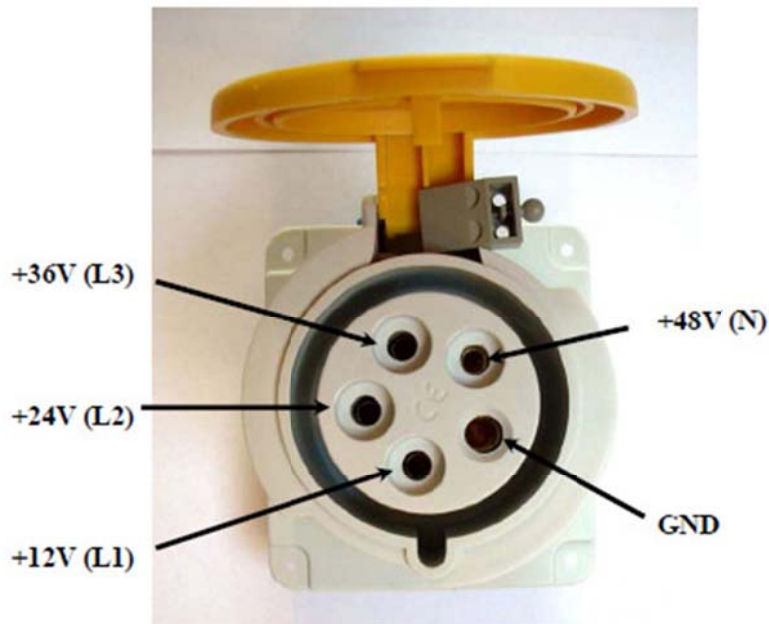


RED ANDERSON connectors mounted on the kart can charge Lithium battery chargers from LiFeBATT Zivan.

The plug has keyed and marked polarity.

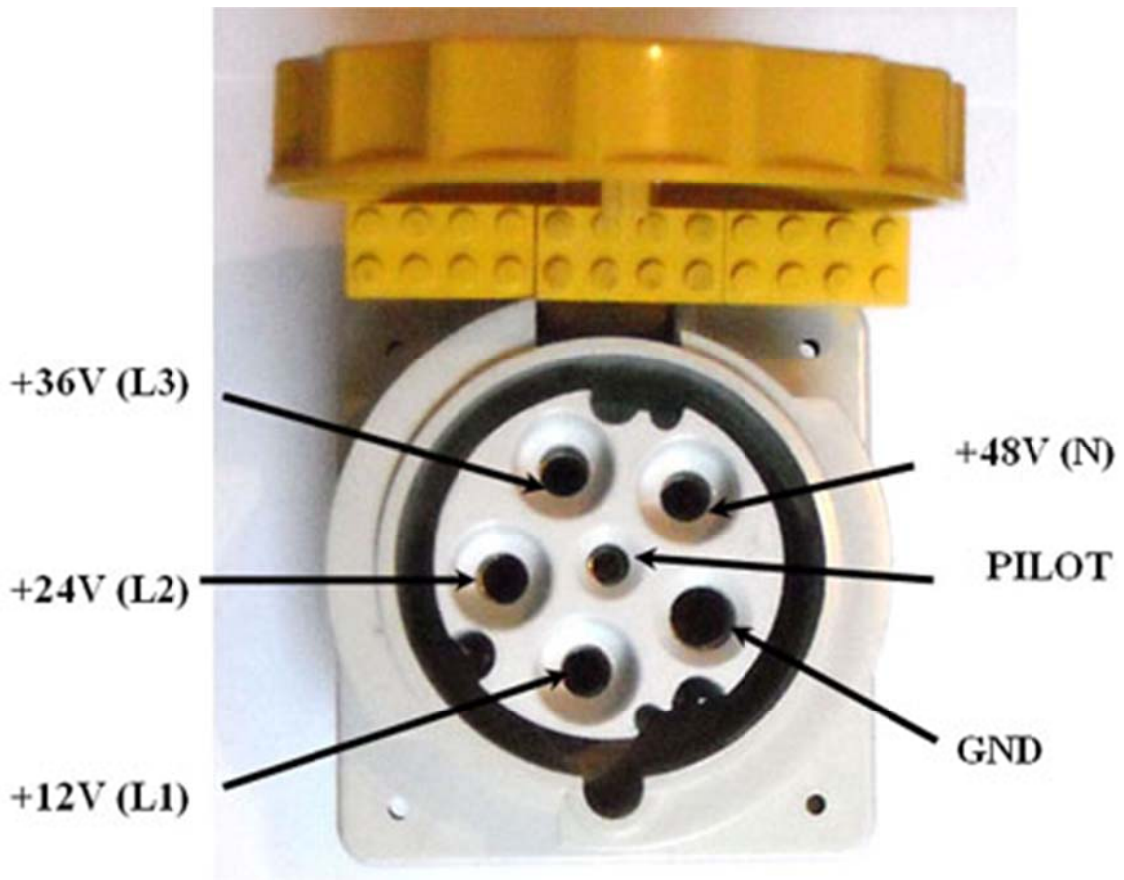
Auxiliary contacts provide remote ON / OFF charger by BPM.

1.14.4 The 5-pin plug 32A YELLOW PRATIKA



The sockets PRATIKA YELLOW 5 pin 3 Phases + Neutral + Earth 32A mounted on the kart allow the unit load from 4 chargers 12V 40A maximum.

1.14.5 The 5 pin 63A YELLOW PK



The sockets PK YELLOW 5 pin 3 Phases + Neutral + Earth 63A mounted on the kart allow the unit load from 4 chargers 12V 70A maximum.

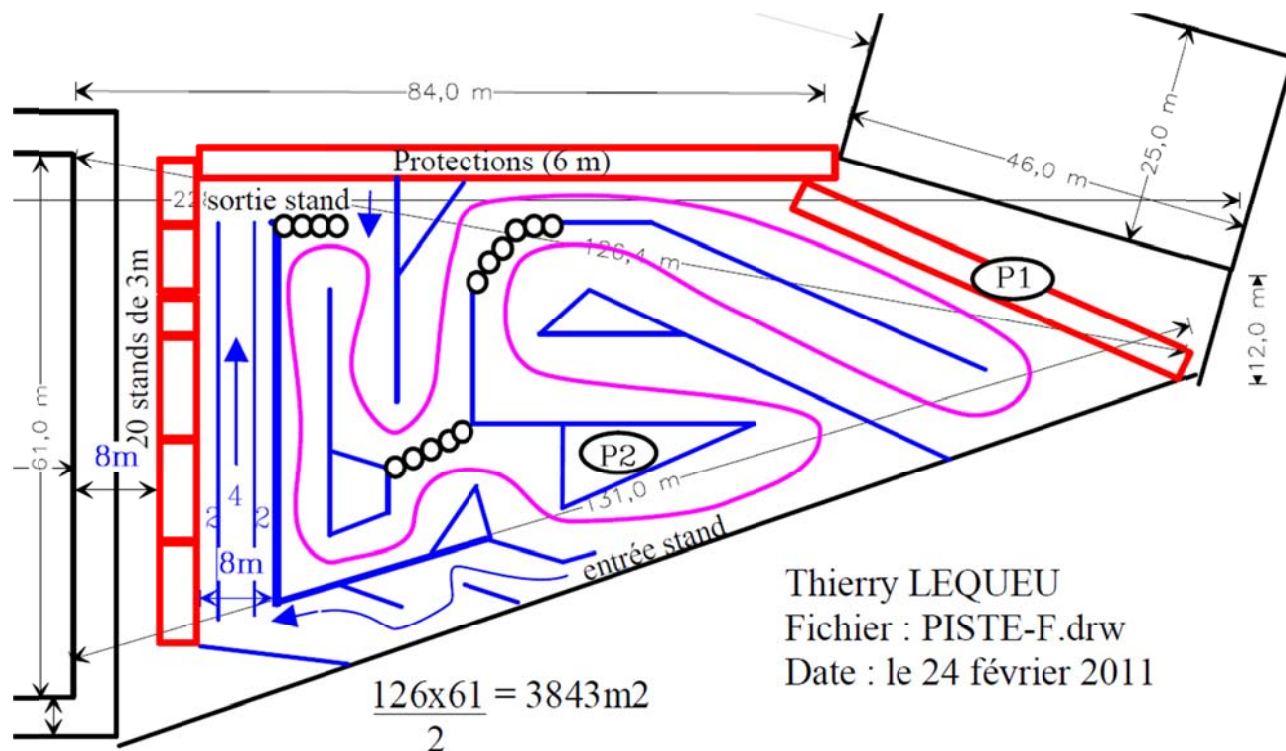
Article 1.15 The outer track of the Parc des Expositions de Vierzon

The track has a surface 3800 m², developed for 250 meters - 350 meters track.

The coating is bitumen medium quality with cracks.



The width of the lanes is 8 meters. The route hugged be:



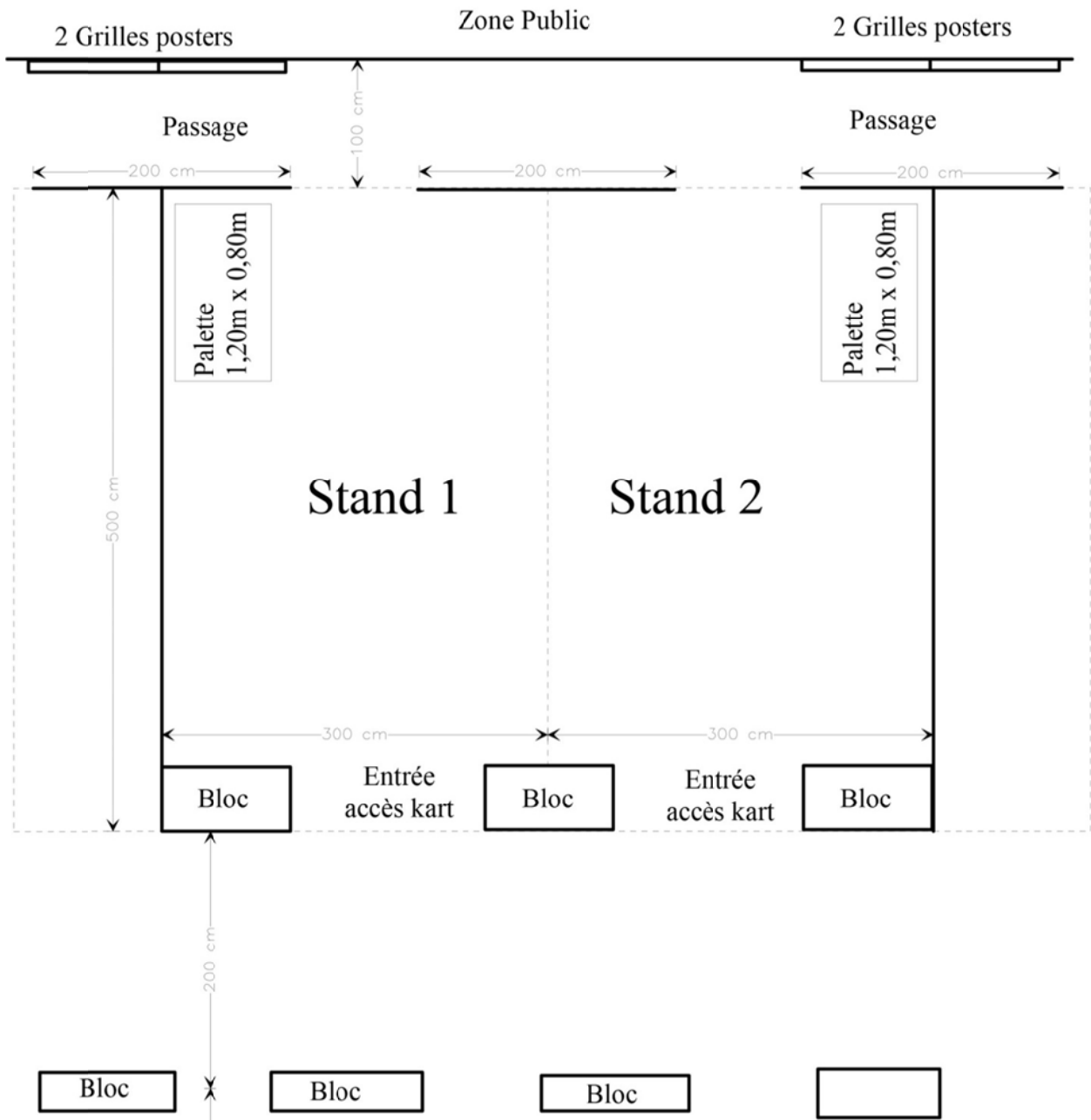
Article 1.16 Dimensions of the stands

An area called "stand", 3m x 5m size, is made available for 1 or 2 team (s) and 2 karts maximum. The stands are "mixed" can accommodate a team of "old" and a team of "new."

The stand has the department number of the team, a letter and possibly a number.

The stands are separated from the area of public traffic by a row of barriers. The posters are visible to the public and have teams located behind the gates.

Each stand have a pallet EUROPE format 120x80cm to put the equipment out of the water in case of rain.



(File: stand-30.drw)

Article 1.17 Timing system Chrono'max

The company has a SPEEDOMAX timing system 13.56MHz RFID. The detection loop is suspended above the track by a gantry.

The height of the sensor loop with respect to the ground is **150 cm**.

The identification plate RFID should be at a height between **95 cm and 100 cm** from the ground.

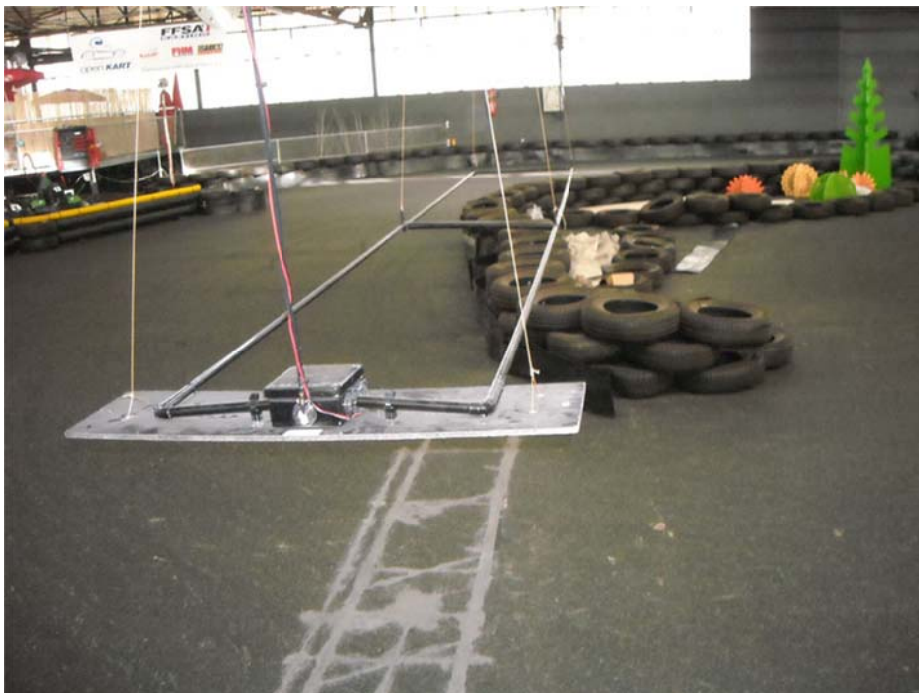


Figure. Detection loop.



Figure. Example of attaching a kart SPEEDOMAX plate and RFID ChronoMax (Red, PVC pipe of 100 mm!).

The RFID chip is glued onto a plastic plate 150mm x 95mm. The plate is fixed by a single hole in the middle of 6mm. A non-metallic support is advisable to avoid high-frequency interference.

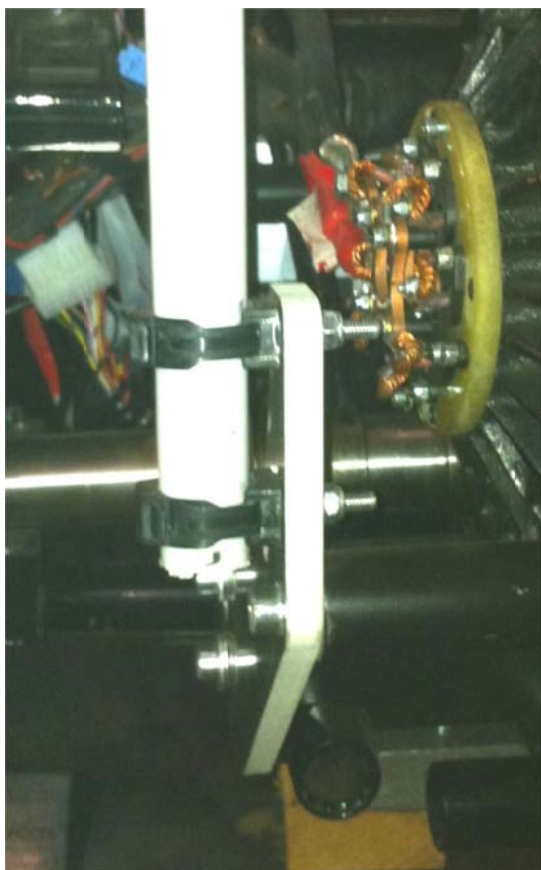


Figure. Example of attaching a kart: 20mm rigid plastic tube + 2 clamps

The timing is set for information to the jury. It isn't used for any ranking. Lap time indicated by this system can be a source of contention.

This system is also used to estimate the number of turns karts during demonstrations of endurance and does not have a 100% reliability: no claim about the totaled the number of rounds will be admissible.

Article 1.18 Power electric supply of the stands

Each stand has 2 electrical connection points for two power chargers. Some stand can be equipped with a three-phase 400V 20A PLEXO Legrand with neutral and earth and fuse 20A 10x38 mm AM Legrand on the 3 phases for connecting three-phases chargers. **It is imperative to clarify what type of connection at registration.**



In 2014, two possibilities for 230V power supply are possible:

- 1) Either the stand is equipped with a so-called plug "power" 16A 230V grounded and fuse 20A 10x38 mm AM Legrand for the main charge.
A second 230V grounded outlet with circuit breaker 5A is available for auxiliary equipment's (PC, phone, camera...).
 - 2) Or the stand is equipped with a double plug so-called "power" 2x16A 230V grounded and fuse 25A 10x38 mm AM Legrand for the main charge.
The second connection, which must not exceed 5A, is available for auxiliary equipment's (PC, phone, camera...).
- The maximum total consumption of the two power output should not exceed 25A.



Figure. 16A double socket for charger and accessories 5A.

Section 2 - Educational events

Article 2.1 Objective tests

- Evaluate the educational work of the students who worked on the electric kart.
- Test characteristics of the kart during the Meeting e-Kart 2014.

Article 2.2 The study subjects

- Manufacturing and assembly of mechanical electric kart.
- Research sponsors.
- Organization and teamwork.
- Technical study related to the electric kart: dynamic behavior, performance, justification of technological choices, economic studies, market research ...
- Realization of the drive and / or charger.
- Realization of embedded electronics: display speed, voltage current, temperature, ...
- Transmission of data to a desktop PC.
- Software development useful electric kart (website, simulator...).
- ...

Article 2.3 Documents to provide

- 1) For schools, it is called a synthesis paper work.

The number of pages is set between 1 and 10 pages. There will be a maximum of 6 authors.

An example of a file in Microsoft Office Word 2007 and PDF format is available on the website <http://www.e-kart.fr/2014/>

Will be provided in PDF format before Friday, May 16, 2014

at thierry-lequeu@gmail.com.

A jury will evaluate the project presentation. The presentation will focus on the completed project, as well as future development, highlighting the collaboration sought.

Of documents can be provided (students report, appendices, ...) (not limited number of pages).

- 2) A poster presentation is also required.

Grid support for dimensions 1.00 m wide by 2.00 m high.

Article 2.4 Composition of the International Jury

The jury is composed of (not exhaustive list):

- 1) François MAEGHT, GEII IUT Bethune, President of the Jury.
- 2) Sylvain CLOUPET, ISTIA Angers.
- 3) Piotr BIZCEL, Université de Varsovie Pologne.
- 4) Arnaud SIVERT, IUT GEII de Cuffie-Soissons.
- 5) Valery DEWANCKER, KARTMASTERS society.
- 6) Laurent HURTARD, IUT GEII Sénart.
- 7) Franck COADOU, ISTIA Angers.
- 8) Alexandre BENOIST, representing the Association e-Kart.

Article 2.5 Tests and declaration of winners

The jury of the Meeting e-Kart 2013 evaluate teaching achievements. Medals awarded to the following events:

- 1) **50 meters stop and start run: Price KARTMASTERS**
The 3 best acceleration karts are rewarded.
- 2) **The “2 hours Surzur” Price CENTRADIS-OPTIMA**
The three teams that carry the greatest number of laps win a prize.
- 3) **The “Meeting of Gazelles” Prize of the City De Vierzon**
The three fastest women’s pilots carry a price.
- 4) **The “Grand Prize of the City of Vierzon” Price ASTECH**
The three teams that carry the greatest number of laps win a prize.
- 5) **The “Silent Price”** reward the kart's quietest paddock.

Concerning educational assessment, the jury will assess each student development from the point of view of the design and the implementation.

The team will highlight the part of the work due to the students due to the teacher. In addition, the evaluation will consider the quality and level of achievement vis-à-vis the skills related to the educational level of students forming the team.

It will be important to specify the state of the kart before handling the projects, list the work, the duration of these changes, the work environment (free time and / or project hours allocated by the institution).

The jury members will move to the stands to interact with teams on the various points within the scope of the criteria taken into account in the allocation of educational prizes.

Thank you to their teams a good welcome and prepare material to present.

The jury can cite the following topics (non-exhaustive list) will be rewarded.

- 1) Communication systems / telemetry between the machine and the team, between machines between them, between the driver and the team.... Integrating or not monitoring applications.

- 2) Designs and / or electrical and mechanical engineering achievements. The achievement by students of electrical, electronic and / or mechanical will be highly appreciated. We can cite for example:
 - a. Realization of inverter
 - b. Realization of battery charger,
 - c. Realization of the elements of the mechanical structure,
 - d. Realization of the power transmission chain,
 - e. Boiler
- 3) Development module (s) active (s) or passive (s) increasing safety kart will be appreciated by the jury. We can cite for example: system detecting the presence of the driver warning system-on heater / Batteries, signaling ...
- 4) The work done by the team to formalize communication media to present developments on the kart. These supports may be reports, posters, websites with a special mention "sharing scientific and technical information."
- 5) Design and aesthetic changes the kart will be highlighted.
- 6) Structure put in place to finance the project, to bring together different institution may be reward (s) by the jury: association or not, solely by funding departments and / or research sponsors, ad hoc approach ...
- 7) Accessibility for persons with reduced mobility will be especially rewarded.
- 8) Innovations in eco-design, the use of recycled materials will be evaluated by the jury.
- 9) The ergonomics of the stand, the friendly staff and the support of participants will be taken into account extra points for the jury.
- 10) Prices for passion, for exchange with foreign institutions ... will be defined locally.

The jury is sovereign and retains the freedom to enjoy developments not mentioned to reward all work in connection with the electric kart.

The "e-Kart Trophy" will be awarded to the team accumulating the most points.

The "e-Kart Trophy" is retained for one year by the winning team and put into play the following year.

The "GESI Trophy" will be awarded to the team for an IUT GEII Department accumulating the most points.

The "GESI Trophy" is retained for one year by the winning team and put into play the following year.

Section 3 - Specifications

Article 3.1 The electric motor

The electric motor can be of direct current technology, asynchronous or synchronous, the energy supplied by a power supply board to the chassis. The voltage generated by the power supply and control system for the engine, is classified into three categories:

- Catégorie 1) Voltage below 48 VDC.
- Catégorie 2) Rated voltage of 48 VDC.
- Catégorie 3) Voltage greater than 48 VDC.

Cooling the motor can be air or water. In the case of a cooling liquid, the circuit must be closed with a separate radiator.

Noise kart driving to a higher speed of 10 km / h,
shall not exceed 60dB.

Article 3.2 The battery power

If power is achieved with batteries, these must be sealed. Three types of bases are planned:

- Catégorie 1) Maintenance-free batteries sealed lead (Pb).
- Catégorie 2) Nickel-Cadmium (Ni-Cd).
- Catégorie 3) It will bring together other battery technologies (eg lithium, zinc-bromine, sulfur, sodium, NIMH, etc ...) if at least one of them is used during the event.

The maximum weight of the batteries is 90 kg weight judged by the manufacturer description (to be submitted with the application form).

A maximum of two sets of batteries per event is allowed to stand with disassembly.

Article 3.3 Battery holder

Batteries must be securely fastened to the chassis. They will be charged through a specific power connector (socket) permanently installed on the kart.

The battery holder with a strap system is PROHIBITED.

Following the test of putting the kart on the side at 90 ° to the right AND left no room or liquid must fall to the ground and the kart will remain operational.

In any case the batteries are removed to be loaded into the stand.

Disassembly of batteries is allowed in case of failures.

Article 3.4 The battery charger

It must be connected to 230V with a 16A plug with a grounding plug. It must meet all the requirements of electrical safety, especially if it is not a commercial product (not 'CE').

The charger should be able to take into account the risk of explosion if the battery voltage and / or temperature rise.

The jury reserves the right to prohibit the use of the charger and batteries in case of danger.

Article 3.5 Transmission

In category "kart series", the transmission is direct or gear on the engine. It should not include transmission but may include a clutch.

In category prototype, the gearbox is permitted.

Article 3.6 Mechanical protection

The rotating parts of the transmission, ie the output of the engine, transmission, rear axle and the brake system should be hooded. Wheels (tires and rims) are not affected by this measure.

Article 3.7 The chassis

It must be equipped with its original accessories, in particular with the braking system, front hubs, rims front / rear, steering components. If the rear axle is changed (independent rear wheels for a differential effect), there shall be a rear wheel braking.

It may be derived from trade and meet the standards CIK / FIA underway. The brand and type of frame are free. Changes related to the installation of batteries and their protections against shocks are permitted.

Article 3.8 Tires

Homologated CIK / FIA 5 inches, 1 set during the event. Reserve a tire is allowed before or after.

Article 3.9 Security kart

In general, the model of chassis and tires must be chosen depending on the performance of the engine and the weight of the kart complete to ensure maximum safety to the driver a view handling and braking. This last point is particularly monitored by the scrutineers of the Meeting e-Kart 2013.

Power protection against short-circuits must be installed and a general circuit breaker, type coup-de-poing emergency stop.

Each team must have a fire extinguisher carbon dioxide CO2 for Class C fires (formerly Class E) Electrical power.

The powder is also effective but the adjacent material is fatal: the powder is corrosive and difficult to clean.

Article 3.10 Body

The following body parts: spoiler, bumper underride guard should comply with FMK / FIA. Pontoons that contain batteries themselves are the subject of a particular technical regulation (see EU regulation).

Article 3.11 Decoration kart

The decoration of the kart shall not show trademarks of alcohol or tobacco, there have message for degrading the condition of any socio-cultural group. Logos and images used must be royalty free or have received a prior authorization.

Article 3.12 Weight of the kart

The maximum weight of the kart without the driver, and with the means of propulsion and batteries should not exceed 240 kg no front brake and 250 kg with front brake.

Article 3.13 Class "kart series"

A kart is classified as "kart series" if it appears in the list of manufacturers listed below. These should be left unchanged.

The list of manufacturers is:

- Speedomax
- Sodikart
- Alpha Karting
- MG Kart
- Asmo
- Otl
- Lintec
- Bowman
- International Indoor Grand Prix
- Shaller
- Swiss Hutless
- Worldkarts
- Electra Motorsports
- Shaller
- Go Kart
- Gravitron
- Formula K
- Freekart
- Alel
- Zytec

Article 3.14 Class "prototype kart"

This class includes the production of free kart meet the following conditions:

Dimensions:

- Length: 2300 mm.
- Width: 1400 mm.

Features:

- **3 or 4 wheels.**
- Number of wheels: free.
- Number of wheels: free.
- Maximum weight 250 kg in working out the pilot.

Electrical characteristics:

- Number of motors: free.
- Maximum voltage 400VDC limited to 10%.
- Isolation 1500 VDC electrical parts.
- Obligatory presence of protective insulation of the battery.
- Mandatory presence of insulation controller for nominal voltage over 72V.
- Powered by number and type of batteries: free.
- Means onboard battery charging allowed (solar panels, fuel cells ...) and energy recovery (braking).

Article 3.15 Class "X-Trium"

This class includes vehicles like X-Trium (thermal and electrical) meets the definition set by Alain DEVEZE.