



CERES G3 TRANSPONDER TIMING SYSTEM

Designed and developed for the sport industry

BeChronized's newest 2019 transponder timing solution

1 INTRODUCTION

The Ceres G3 Transponder Timing System is our newest 2019 solution which replaces our former Ceres G2 Transponder Timing System (from 2012 until 2018). Over the years technology evolved as well as our customer's requirements and this allowed us to design and develop our newest 2019 Transponder Timing Solution.

This new system contains the latest available technological evolution to ensure continuity to our customers but also to meet to the latest requirements within the different sports markets. The Ceres G3 Transponder Timing System is a portable system which can easily be used by sport event organizers, timekeepers, local sport clubs or teams, but it's also possible to ensure a fixed installation onto race venues or sports complexes.

The Ceres G3 Transponder Timing Solution is standardly composed of following items:

- One or multiple portable decoder units
- One or multiple stand-alone loop boxes
- The transponders
- The timing software



2 THE PORTABLE DECODER UNIT

The portable decoder unit is the central unit of the system which will receive and process the transponder passings. For outdoor activities this unit has often to endure rough handling, transport and weather conditions and that's why we made sure that this unit can be used in the harshest environmental conditions.



This unit has a watertight, crushproof and dustproof Peli® Case with an automatic pressure equalization valve which balances the interior pressure and keeps water out. All the external and internal NEUTRIK connectors are from the TOP range (True Outdoor Protection) and the remaining internal elements are splash to waterproof. Furthermore, the exterior dimension of this unit is 27 x 24,6 x 12,4 cm and has a total weight of 2,72 kg. This means that you have a very compact and lightweight portable decoder unit for handling and transportation purposes.

The portable decoder unit has following specifications:

- Watertight, crushproof and dustproof Peli® Case
- Exterior dimension of 27 x 24,6 x 12,4 cm
- Total weight of 2,72 kg
- Raspberry Pi 3 Model B+
- 5" 800x480 HDMI Touch Display
- GPS module
- Internal Li-Ion rechargeable battery (up to 20 operating hours)
- External and internal TOP NEUTRIK connectors (True Outdoor Protection)
- BNC connectors with cover caps
- 3x LED indicators
 - Orange LED: Status
 - Green LED: Data
 - Red LED: Battery
- Overview of the connectors
 - Inside: 1x USB 3.0, 2x Inputs, 1x 3.5mm Jack, 1x On/Off button
 - Back side: 1x Ethernet LAN, 1x USB 3.0, 1x Input, 1x Output
 - Right side: 1x Power Input
 - Left side: 1x Receiver, 1x Transmitter



3 THE STAND-ALONE LOOP BOX

The stand-alone loop box is the device which triggers the transponders and functions as a timing point like the finish line, an intermediate line, a check point, a split time or a sector time. This loop box is not physically connected to the portable decoder unit, but it is autonomously powered by an external 12V battery pack or a 220V-240V power adaptor. The metal case of this loop box is waterproof as well as its TOP NEUTRIK power connector (True Outdoor Protection). Furthermore, the stand-alone loop box is equipped with a potentiometer to be able to regulate the strength of the electromagnetic field.



The stand-alone loop box has an internal GPS module and in combination with the internal memory of the new transponder you will be able to store transponder passings' times into the transponder. When the transponder is close-by the main system, the transponder passings' times will be transmitted to the main system in real time. In case of remote timing points which are not within the live transmission range, the transponder will store its passings' times and transmits them to the main system when crossing the finish line.



4 THE TRANSPONDERS

The Transponders are the devices which are worn by the participants. Each Transponder has a unique code a.k.a. Transponder Number in order to identify each participant and to record the exact time at which they pass a timing point or finish line.

Compared to the previous Ceres G2 Transponders, our new Ceres G3 Transponders have an internal memory to store passing times (remote timing points), a longer lifespan, a higher accuracy and a 3D activation antenna.

All our transponders:

- are programmable by yourself (choose the desire transponder number)
- are equipped with an internal Lithium battery that requires no charging
- are 100% sealed and waterproof
- have a life expectancy of about 5 years
- have a height detection up to 3 meters



BECHRONIZED CERES G3 TRANSPONDER TIMING SYSTEM

The Ceres G3 ProActive Transponder is used for active sports like Cycling (Road, Track, Cyclocross, BMX and Mountain bike), Roller Speed Skating a.k.a. Inline Skating, Duathlon and Triathlon, Running, Cross country events, Mud events and Horse endurance racing. Its small and lightweight design is easy to be worn or fix in an optimal position for readability and comfort. Simplicity, accuracy and reliability are all captured in this small device, the BeChronized Ceres G3 ProActive Transponder.



Specifications	Ceres G3 ProActive Transponder
Timing accuracy	0.005 seconds
Internal memory	Yes, to store passing times
Maximum speed	100 km/h
Maximum detection height	Up to 3 meters
Temperature range	Standard: – 40°C to +70°C
Dimensions	25 x 25 x 9 mm
Weight	15 grams
Housing	100% sealed, weather resistant and waterproof
Battery type	Lithium
Fixation	Tie wraps, Velcro straps or self-adhesive pockets

The Ceres G3 ProRange Transponder is used for motorized sports like Motocross MX and Supercross SX, Moto and Car Circuit Racing, Moto and Car Rallies, Autocross, Stock Car and Prototype Racing. Its small and lightweight design is easy to be worn or fix in an optimal position for readability and comfort. Compared to its predecessor, the external antenna is completely integrated in the housing which makes this new transponder even more durable. Simplicity, accuracy and reliability are all captured in this small device, the BeChronized Ceres G3 ProRange Transponder.



Specifications	Ceres G3 ProRange Transponder
Timing accuracy	0.005 seconds
Internal memory	Yes, to store passing times
Maximum speed	250 km/h
Maximum detection height	Up to 3 meters
Temperature range	Standard: – 40°C to +70°C
Dimensions	30 x 30 x 10 mm
Weight	22 grams
Housing	100% sealed, weather resistant and waterproof
Battery type	Lithium
Fixation	Tie wraps, Velcro straps or self-adhesive pockets

5 Backward compatibility with the Ceres G2 Transponder Timing System

The life cycle of the Ceres G2 transponder timing system is coming to an end (from 2012 until 2018), both from a production point of view (obsolescence of the used electronic components) as from a technological point of view (the technical characteristics related to this technology that makes it possible – or not – to cover the current customer’s requirements).

New customers will be able to directly enjoy and make use of the new Ceres G3 Transponder Timing System. Existing users of the Ceres G2 Transponder Timing System will have the choice to fully or gradually switch over to the new Ceres G3 Transponder Timing System.

Regarding the Ceres G2 Transponder Timing System, the production of the decoder units has been stopped and there are no decoder units available anymore. The Ceres G2 Transponders (ProActive, ProRange and ProSpeed) and some Ceres G2 Accessories are still under production and available for a certain period of time.



As the Ceres G2 and Ceres G3 Transponder Timing System have some similarities but mainly differences in the way they process their respective transponders, the Ceres G2 Transponders cannot directly be processed by the Ceres G3 Portable Decoder Unit and the Ceres G3 Transponders cannot be processed by the Ceres G2 Decoder Unit. Nevertheless, it’s possible to use both the Ceres G2 and Ceres G3 Transponders simultaneously during a same event by coupling/making a bridge from the Ceres G2 Decoder Unit to the Ceres G3 Portable Decoder Unit. Like this owners and users of Ceres G2 Transponders can use those transponders until their lifespan has expired, before switching completely to the new Ceres G3 Transponder Timing System.

6 THE TIMING SOFTWARE

Over the years, we have developed in-house timing software packages and have closed partnerships with companies specialized in timing software development area.

Our different timing software suites allow you to manage and process the collected race data in active and motorized sports at your convenience. Printing the overall ranking of a race or by category, adjusting the layout of the printouts, displaying the results on an extra screen or LED scoreboard, uploading the results to the internet all belong to the possibility among many other functions.

You would like to use your own timing software package? No problem! We give the communication protocol of our Ceres G3 Transponder Timing System freely so that you can integrate your own timing software package into our system.

7 COMPLEMENTARY TIMING AND SCORING SYSTEMS

Specialized in Transponder Timing Technology, we're able to offer you complementary Timing or Scoring Solutions like Photo-finish systems or Scoreboards according to your needs.

In many sports different timing technologies are combined together to offer state of the art timing results. Accurate, reliable and fast timing results are the key words in our sport timing industry.