RACE RESULT

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MAKING IT HAPPEN

How a semi-permanent timing installation helped the "Salzkammergut Trophy" adapt to Corona restrictions

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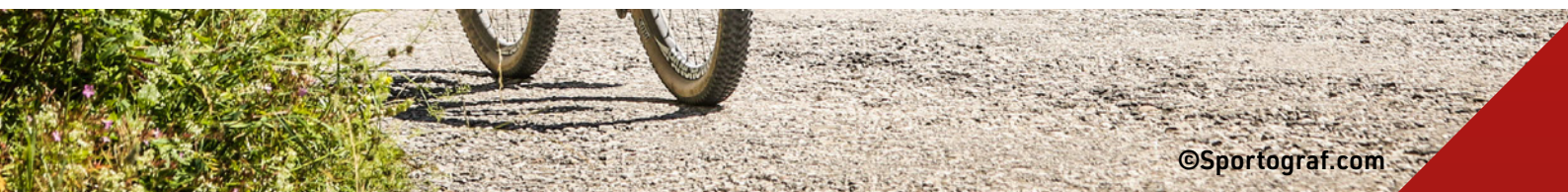
salzkammergut trophy 2020

GLOBAL SPORTSERVICE



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Introduction

A mountain bike race that complies with social distancing rules - is that even possible? The organizers of the Salzkammergut Trophy, the largest mountain bike festival in Austria, faced this question.
More than **5,000 participants** from over **40 nations** had taken part in 2019's race weekend. In response to the COVID-19 Pandemic, the idea of a **"Trophy Individual"** was born. The goal was to redesign the event for 2020, taking on a different format. The athletes should be offered a **new experience** that would make them want to travel to the event location.

The race course is now marked with signs for **four months** and equipped with a permanent timing installation.

This permanent installation allows all participants to complete their race on any day and compare their results and rankings online. Participants can decide which of the courses they want to ride and can compete any number of times, using the same start number.

In this case study, the concept of a **permanent UHF timing installation** is explained in detail. Prototypes of the **RACE RESULT Track Box Passive** were used. With the help of **RACE RESULT 12 timing software**, a customized event file was created. Transponder data is now automatically collected, results are calculated and published online, Track Boxes are monitored - all within one software.

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Thank you!

The Salzkammergut Trophy is organized by the **MTB Club Salzkammergut**.

Global Sportservice from Graz, Austria has been supporting the event for many years as a service provider for timekeeping and presentation of results. Global Sportservice worked hard to master the challenge of an "Individual Trophy". At the same time, it is a great showcase for this internationally successful timing company on how they implement such outstanding setups. RACE RESULT is happy to help here. Support Specialist Ugo Durand put his great skills into creating the high-end event file. For the RACE RESULT engineering team, it was a great opportunity to test the Track Box Passive as a prototype and further improve it. We would like to thank everyone involved for their contribution to this great project!

1 The Challenge

1-1 Event Organizers

The COVID-19 Pandemic has plunged the worldwide sports industry into a profound crisis.
Social distancing rules and event restrictions made it virtually impossible to hold races for months. This has **financially devastating** effects for organizers. They have been investing for months to prepare events, only to be faced with costly cancellations, refunds, and often sponsors backing out. Added to this is potential damage to the brand image. Sports events thrive on their regularity. If you cancel, there is also the risk of losing emotional ties to participants, volunteers and sponsors.

Once the annual streak is broken, it is twice as difficult to restart.
At an event the size of the Salzkammergut Trophy, tourism and hospitality in the region would also suffer from a cancellation.

The organizers therefore endeavored to develop a concept in which the already registered participants can take part in the race - in compliance with the applicable local restrictions. In Parallel, the sponsors wanted to be given the opportunity to present themselves appropriately.

1-2 Timing

Even before the COVID-19 Pandemic, organizers and timekeepers developed concepts for **"virtual" races**. Athletes can do a certain course or distance, measure their personal racing time themselves and enter it in an online portal. Once complete, results are shown in a list similar to a regular event. This idea is mainly used for running events.

Other systems analyze **GPS** data that participants record and upload themselves. The race result can be generated from this.

Neither concept was the right one for the Salzkammergut Trophy. The aim of the event is always to lure the athletes to the **Salzkammergut region** and let them ride on the **stunning trails**. A virtual race format was therefore no substitute for the festival.
A leaderboard based on GPS data from the "real" racetrack was also out of the question for two reasons: The results would have to be checked individually for each participant.
A manual comparison of the participant data and the GPS route of the racetrack would consume a lot of time and resources.
At the same time, a virtual competition as such would encourage risky riding. For months there would be a risk of serious falls and collisions with other trail users on the unclosed route.

Coronavirus situation in Austria

After a lockdown in mid-March, the corona restrictions in Austria were gradually lifted from May onwards. Hotels and Restaurants reopened in June. Visitors can enter from almost all European countries. In certain public places, such as supermarkets, wearing a face mask is mandatory.

(Status: August 1, 2020)

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2 The Solution

Together, **Global Sportservice** and the **MTB Club Salzkammergut** developed the idea of a timing installation that can operate safely over a longer period of time.

Only certain sections of the circuit are measured, especially climbs. These times are added and form the individual result of the athlete. The timed sections do not contain any downhills, crossroads or city crossings. This increases safety.

2-1 Track Box Passive

A main component of the solution is the **RACE RESULT Track Box Passive**.
Global Sportservice was given the opportunity to use this completely new timing system as a prototype.
The handy box contains a **UHF reader** that receives transponder signals and forwards them to a server via the LTE network. This data is combined with the **GPS location** and **GPS time** of the Track Box.
The **transponder** is attached to the participant's handlebar number.
This installation can be used to measure exactly when the participant crossed which timing point on the course.

Detailed information about the Track Box Passive:
[Track Box website]

RACE RESULT Track Box Passive

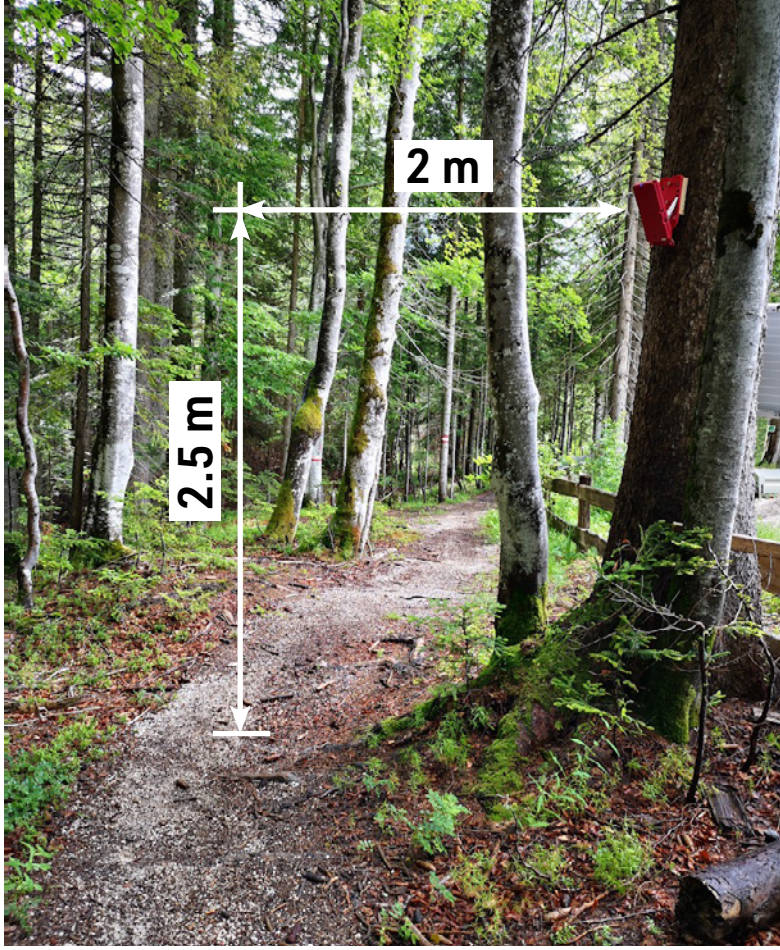
RACE RESULT Passive Transponder

2-1.1 Setup Along the Course

At the "Trophy Salzkammergut Individual", riders can choose from **seven different courses**.
Seven timed sections are spread over an area of over **200 km²**. Each section is part of several courses.
Global Sportservice installed a total of 25 Track Boxes.

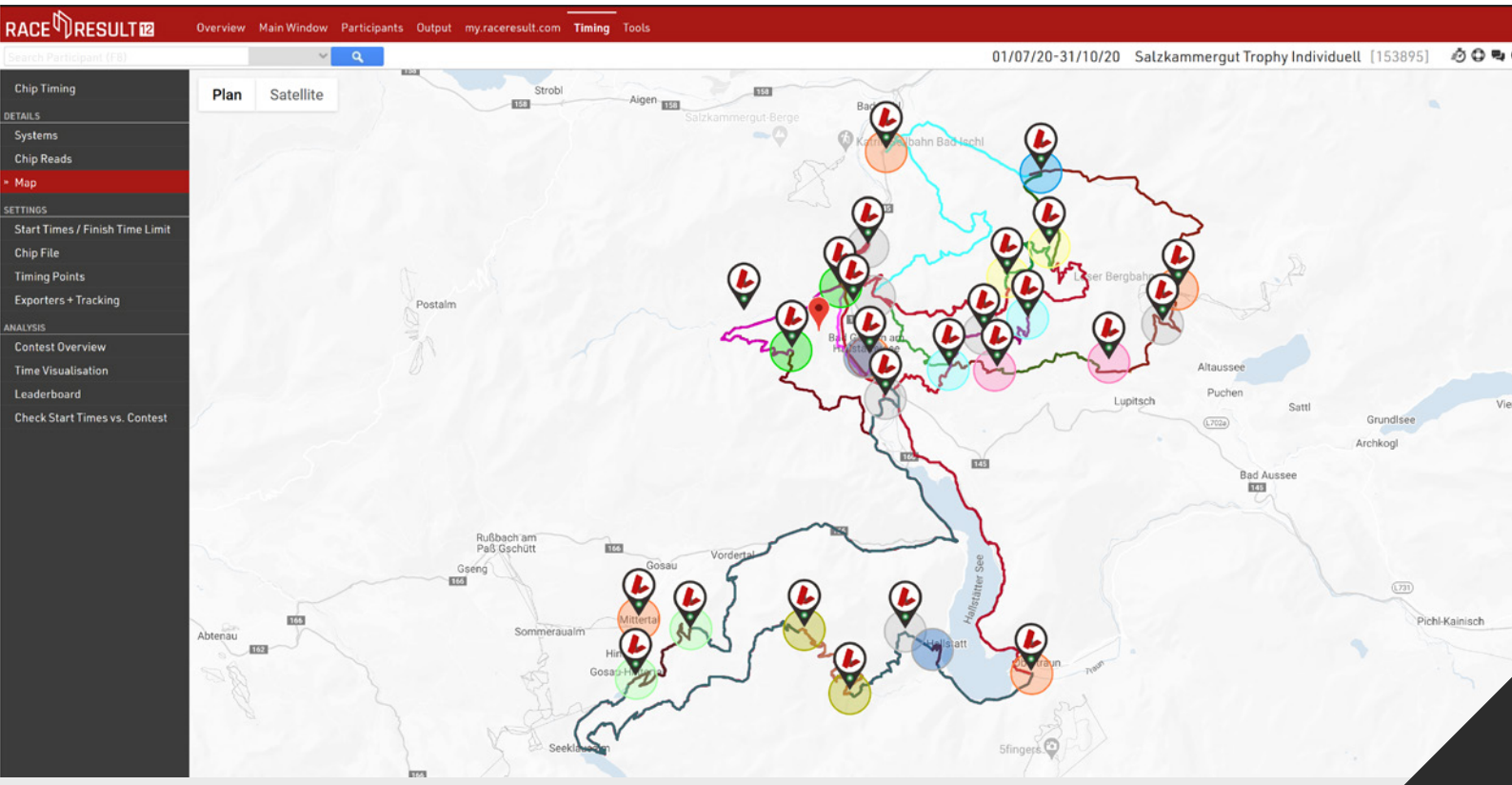
The boxes are mounted at a height of approximately **2.5 meters**. This protects them from easy access by unauthorized persons and there is no risk of spectators standing between the box and the transponder. The distance to the course is about **2 meters**.
The **best detection rates** are achieved within **4 meters** range. Each box is aligned at a **90° angle** to the course.
The incline of each box can be adjusted in **four steps**. This aligns the internal antenna towards athletes as precisely as possible.

The boxes are mostly attached to a wooden post or board with screws. They also have built-in **magnets** that make it easy to attach them to street signs or lampposts.
The Boxes could also simply be placed **on the ground**. However, this is not recommended for permanent installations.



Track Box Passive alignment options:

Map with segments and Timing points in RACE RESULT 12 software



2-1.2 Solar Operation

The **internal battery** of the Track Box Passive is sufficient for at least **twelve hours** of operation - enough for a conventional race, but not enough for permanent installations.
Since some timing points of the Salzkammergut Trophy are far from any technical infrastructure, it is not possible to connect all Track Boxes to mains power.

The solution here is in the **built-in solar mode**. The box detects when it is directly connected to a solar panel and will optimize the solar power input by adjusting its power consumption. In normal weather conditions at the Salzkammergut Trophy with partly cloudy days, the battery of the box hovers around 75%.

Eleven of the 25 Track Boxes **run on solar power**. The power consumption of each Track Box Passive has so far always been covered by the solar panel. No box has had to be recharged via the mains power lead. Only in one case the position of the solar panel was adjusted to increase the yield.

Solar Cells for Track Box Passive

Panel requirements:

- 17V nominal "12V" panel class
- 25V DC MAX Voltage at no load
- min 10W (30W or 50W recommended)

Power consumption:

In Solar Mode, the Track Box tries to maximize the solar cell power by adjusting its input power between 10W/8W/6W/4W depending on the power received from the solar panel.

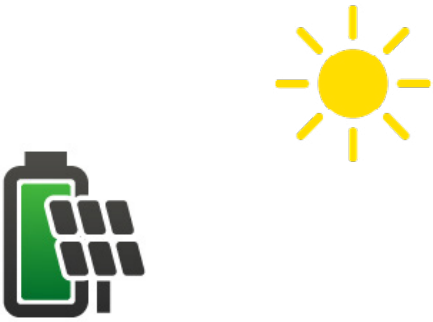
At 4W, the internal batteries will not be charged, but the power consumption of the box itself is covered. At 10W, it takes about 10h to charge the Track Box from 0% to 90% when the reader is turned on.

Find more details in the RACE RESULT Knowledge Base:
[Solar Mode Manual]

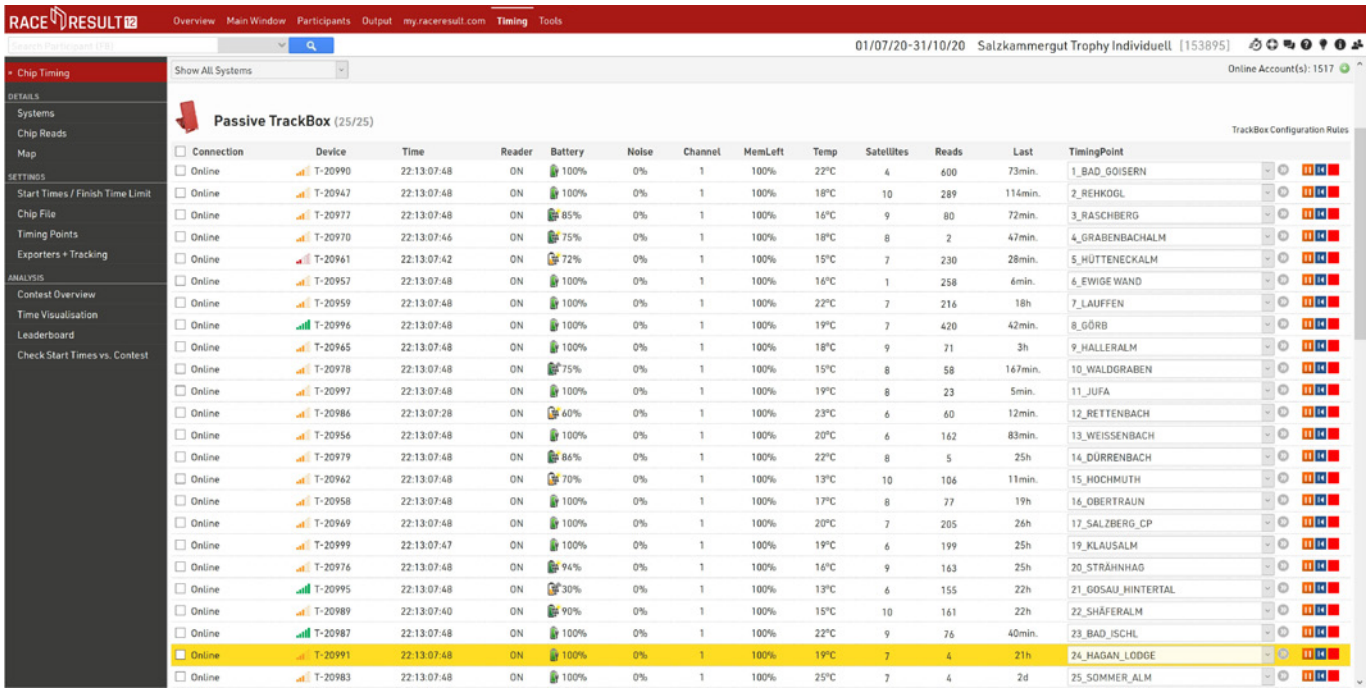
2-1.3 Track Box Monitoring

The Track Box Passive is fully integrated in the **RACE RESULT 12 timing software**.
The Timing tab shows all the devices online, their **battery levels**, whether they are connected to a source of power, the temperature, the satellites, mobile network reception, and much more.
In **solar mode** a special icon indicates whether the panel is currently providing power or not.

It is possible to **control the boxes remotely**, and to set them to turn their UHF reader on or off with the **Auto Standby mode**, so that they can stay on overnight without emptying the battery completely.



Timing System Overview in RACE RESULT 12



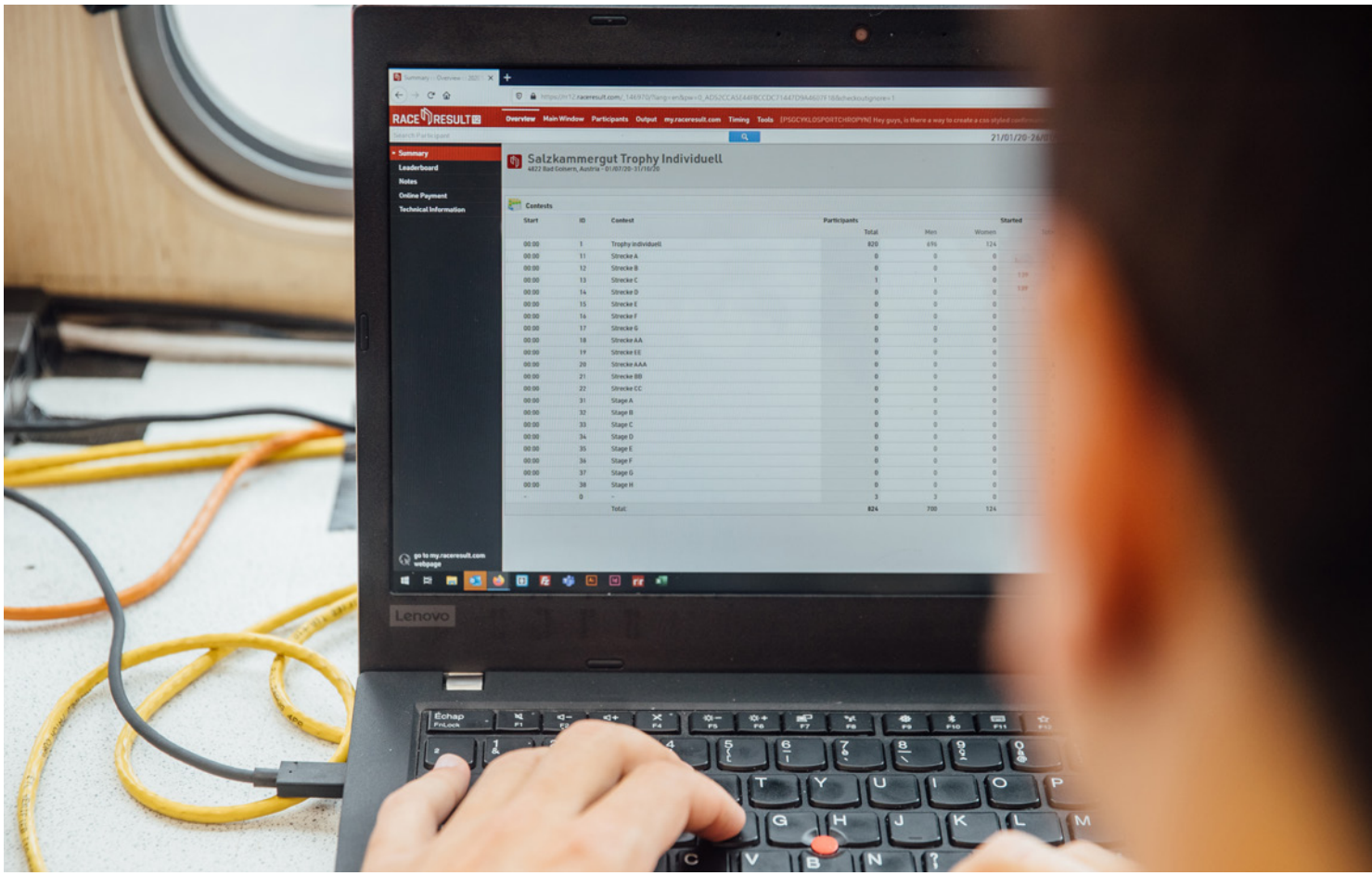
Connection	Device	Time	Reader	Battery	Noise	Channel	MemLeft	Temp	Satellites	Reads	Last	TimingPoint
Online	T-20990	22:13:07:48	ON	100%	0%	1	100%	22°C	4	600	73min.	1_BAD_GOISERN
Online	T-20947	22:13:07:48	ON	100%	0%	1	100%	18°C	10	289	114min.	2_REHKOGL
Online	T-20977	22:13:07:48	ON	85%	0%	1	100%	16°C	9	80	72min.	3_RASCHBERG
Online	T-20970	22:13:07:46	ON	75%	0%	1	100%	18°C	8	2	47min.	4_GRABENBACHALM
Online	T-20961	22:13:07:42	ON	72%	0%	1	100%	15°C	7	230	28min.	5_HÜTTENECKALM
Online	T-20957	22:13:07:48	ON	100%	0%	1	100%	16°C	1	258	6min.	6_EWIGE WAND
Online	T-20959	22:13:07:48	ON	100%	0%	1	100%	22°C	7	216	18h	7_LAUFFEN
Online	T-20996	22:13:07:48	ON	100%	0%	1	100%	19°C	7	420	42min.	8_GÖRB
Online	T-20965	22:13:07:48	ON	100%	0%	1	100%	18°C	9	71	3h	9_HALLERALM
Online	T-20978	22:13:07:48	ON	75%	0%	1	100%	15°C	8	58	167min.	10_WALDGRABEN
Online	T-20997	22:13:07:48	ON	100%	0%	1	100%	19°C	8	23	5min.	11_JUFA
Online	T-20986	22:13:07:28	ON	60%	0%	1	100%	23°C	6	60	12min.	12_RETTENBACH
Online	T-20956	22:13:07:48	ON	100%	0%	1	100%	20°C	6	162	83min.	13_WEISSENBACH
Online	T-20979	22:13:07:48	ON	86%	0%	1	100%	22°C	8	5	25h	14_DÜRRENBACH
Online	T-20962	22:13:07:48	ON	70%	0%	1	100%	13°C	10	106	11min.	15_HOCHMUTH
Online	T-20958	22:13:07:48	ON	100%	0%	1	100%	17°C	8	77	19h	16_OBERTRAUN
Online	T-20969	22:13:07:48	ON	100%	0%	1	100%	20°C	7	205	26h	17_SALZBERG_CP
Online	T-20999	22:13:07:47	ON	100%	0%	1	100%	19°C	6	199	25h	19_KLAUSALM
Online	T-20976	22:13:07:48	ON	94%	0%	1	100%	16°C	9	163	25h	20_STRÄHNHAG
Online	T-20995	22:13:07:48	ON	30%	0%	1	100%	13°C	6	155	22h	21_GOSAU_HINTERTAL
Online	T-20989	22:13:07:40	ON	90%	0%	1	100%	15°C	10	161	22h	22_SHÄFERALM
Online	T-20987	22:13:07:48	ON	100%	0%	1	100%	22°C	9	76	40min.	23_BAD_ISCHL
Online	T-20991	22:13:07:48	ON	100%	0%	1	100%	19°C	7	4	21h	24_HAGAN_LODGE
Online	T-20983	22:13:07:48	ON	100%	0%	1	100%	25°C	7	4	2d	25_SOMMER_ALM

Since the communication protocol of the Track Box is public, it is also possible for developers to build their own tools to monitor the status of the systems, or to send them specific commands.

For the Salzkammergut Trophy, Global Sportservice is using several PCs to **constantly monitor** the Track Boxes, results and other features of the timing setup.

2-2 Timing Software RACE RESULT 12

With **5,500 participants**, contests over **7 courses** and two different days, and a multitude of timing points across the Austrian Alps, the Salzkammergut Trophy is already a challenging event for a timer on a normal year. But at least it is known in advance who will start when and on which course.



Learn more about RACE RESULT 12:
[Timing software website]

The format chosen this year to run the event in a way that complies with safety measures adds several requirements making it even more of a **challenge**: Participants can come any day, as many times as they want, and complete any course they want. To avoid groups forming at one point of the course, it is possible to start and finish from different locations, the "extreme" course for example is available in three different versions.

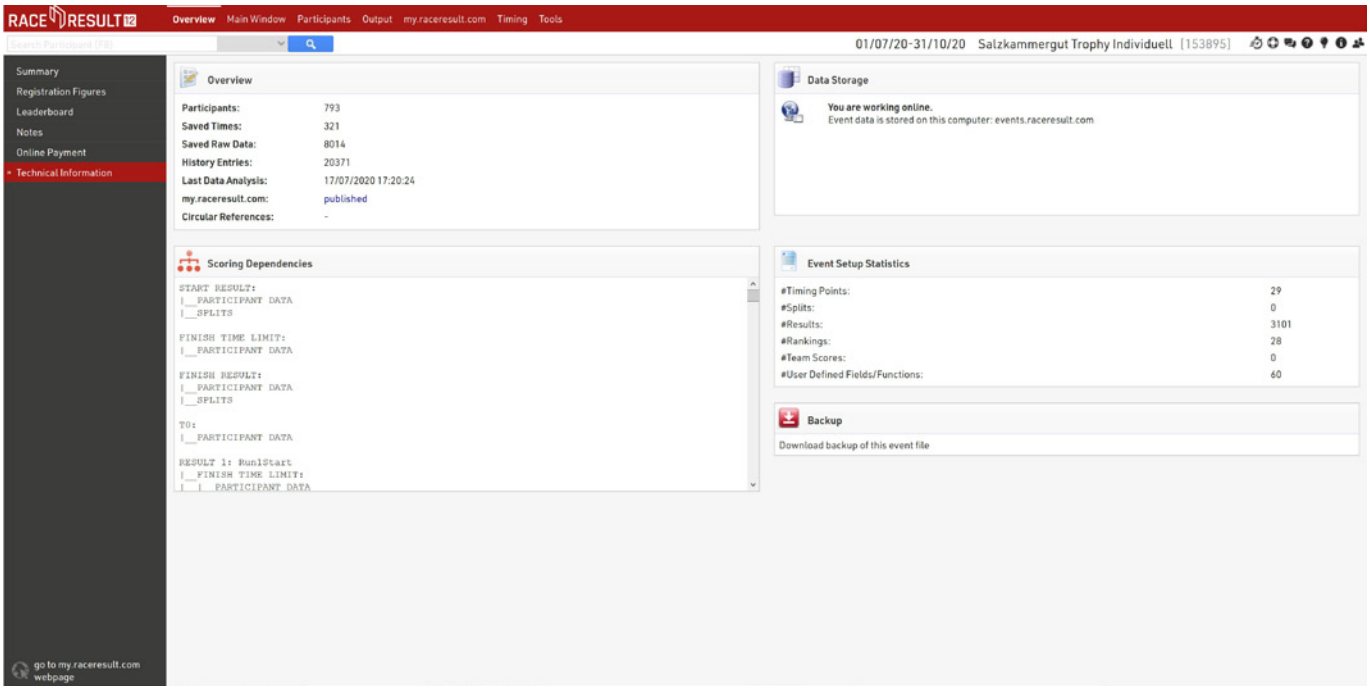
To score this format of event, it is necessary to monitor the systems every day, to process the data efficiently, and to have a user-friendly platform to display the results. Used right, RACE RESULT 12 ticks all the boxes.

2-2.1 Processing the Data & Scoring the Event

Confronted with this kind of challenge, RACE RESULT 12 shows how **flexible** it is. This format takes a completely different approach compared to a traditional event with one start, one finish, and a few splits in between.

Here, chip detections at 5 defined starting locations are used to determine that a rider has started a "run". The detections collected by the Track Boxes on course during a certain time after the start of the "run" are checked to determine whether they match the defined sequence of one of **12 possible courses** (there are officially 7 courses, but some are available with different start and finish locations).

Overview of the event file in RACE RESULT 12



Setting up multi-day races in RACE RESULT 12:
[Knowledge Base: Multi-Day events]

If a match is found, then the course is validated and the rider appears in the results for that course, ranked based on the sum of the timed sectors they completed (downhill sections are ignored, so that riders do not take any risks on an unsupervised course).

Scoring this type of event would not be possible without the ability to write **user-defined fields** and **functions**, which allow for scaling of the calculations over 123 days of racing.

It must be said though that this event is pushing RACE RESULT 12 to the limit, with a large number of result IDs and very **complex scoring dependencies**.

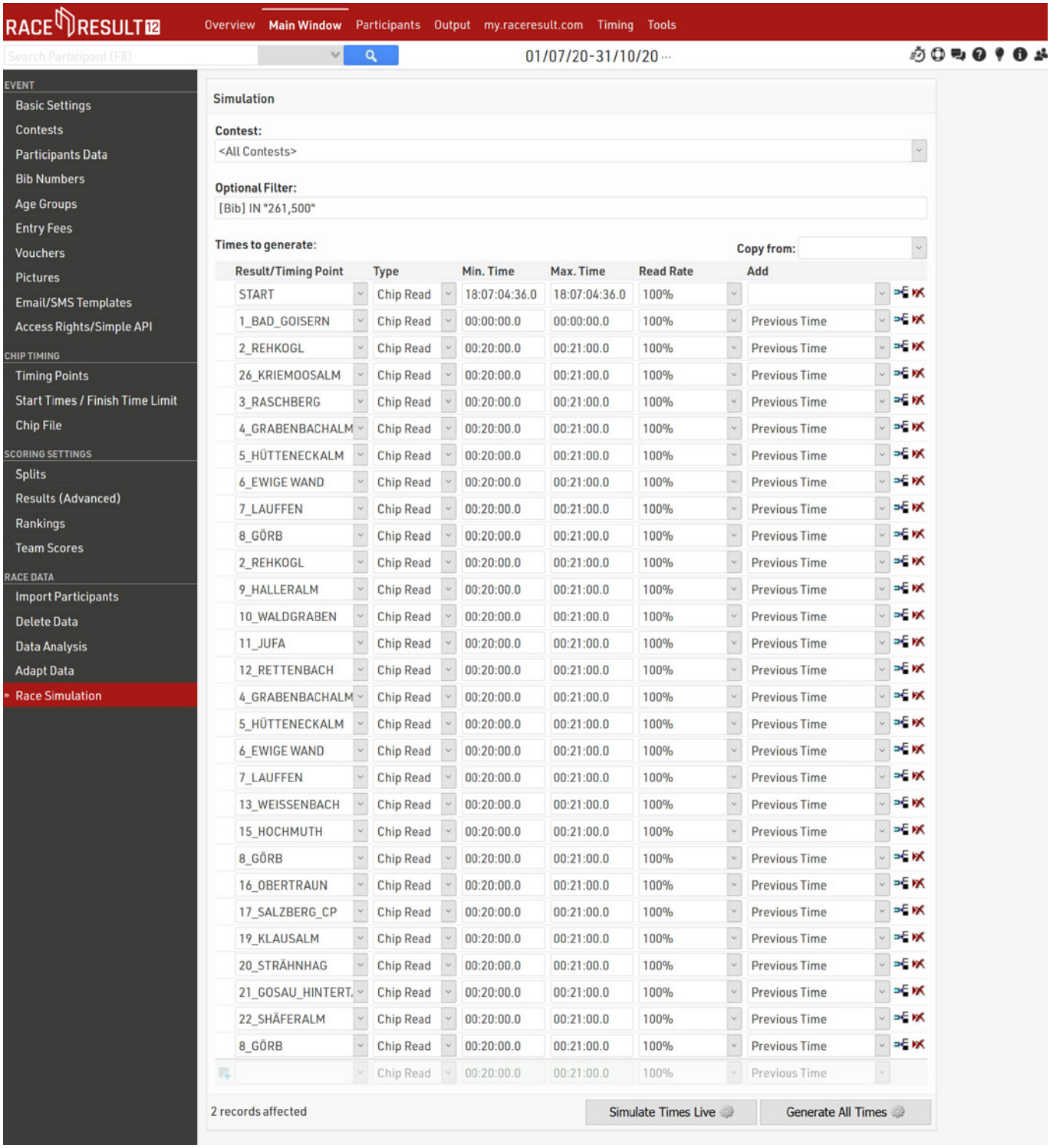
2-2.2 Testing & Controlling

Such an extensive set up requires thorough **testing** to make sure everything is calculated as expected.

Each possible course is defined as a race simulation in the event file, with dedicated Output lists to display the test data at every stage of the calculation.

The file also has two reports set up, one displaying a calendar with the number of participants detected on each day, another with the ability to select a day and display all the riders who were on course that day, with the course they completed (if any). This way, it is easy to access the relevant riders and check their data at the end of each day.

Race Simulation in RACE RESULT 12



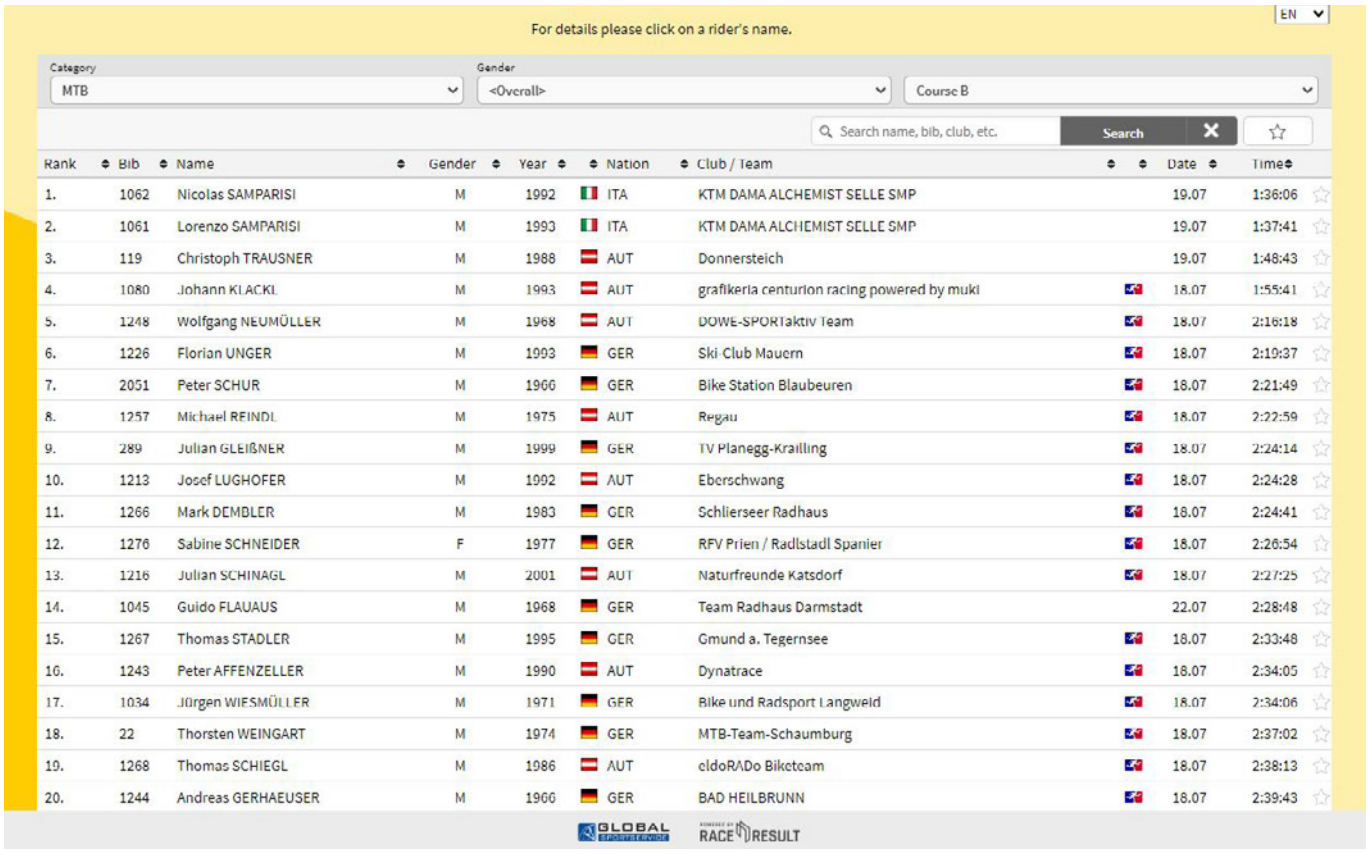
2-2.3 Presenting Results

The **my.raceresult.com** platform is the perfect tool to display **results online**, and allow participants to check all their sector times and download their certificate with all completed courses, giving them an incentive to complete as many as possible.

The **new features** of the Output window (drop-down filters, AutoRank, Selector, new responsive design logic) have helped a lot in building user-friendly results with intuitive navigation, while reducing the number of different reports.

Find the results page here:
[Salzkammergut Trophy results]

Dropdowns to filter data for high user-friendliness



Rank	Bib	Name	Gender	Year	Nation	Club / Team	Date	Time
1.	1062	Nicolas SAMPARISI	M	1992	ITA	KTM DAMA ALCHEMIST SELLE SMP	19.07	1:36:06
2.	1061	Lorenzo SAMPARISI	M	1993	ITA	KTM DAMA ALCHEMIST SELLE SMP	19.07	1:37:41
3.	119	Christoph TRAUSNER	M	1988	AUT	Donnersteich	19.07	1:48:43
4.	1080	Johann KLACKL	M	1993	AUT	grafikerla centurion racing powered by mukl	18.07	1:55:41
5.	1248	Wolfgang NEUMÜLLER	M	1968	AUT	DOWE-SPORTaktiv Team	18.07	2:16:18
6.	1226	Florian UNGER	M	1993	GER	Ski Club Mauern	18.07	2:19:37
7.	2051	Peter SCHUR	M	1966	GER	Bike Station Blaubeuren	18.07	2:21:49
8.	1257	Michael REINDL	M	1975	AUT	Regau	18.07	2:22:59
9.	289	Julian GLEIßNER	M	1999	GER	TV Planegg-Krailling	18.07	2:24:14
10.	1213	Josef LUGHOFER	M	1992	AUT	Eberschwang	18.07	2:24:28
11.	1266	Mark DEMBLER	M	1983	GER	Schlierseer Radhaus	18.07	2:24:41
12.	1276	Sabine SCHNEIDER	F	1977	GER	RFV Prien / Radlstadl Spanier	18.07	2:26:54
13.	1216	Julian SCHINAGL	M	2001	AUT	Naturfreunde Katsdorf	18.07	2:27:25
14.	1045	Guido FLAUAUS	M	1968	GER	Team Radhaus Darmstadt	22.07	2:28:48
15.	1267	Thomas STADLER	M	1995	GER	Gmund a. Tegernsee	18.07	2:33:48
16.	1243	Peter AFFENZELLER	M	1990	AUT	Dynatrace	18.07	2:34:05
17.	1034	Jürgen WIESMÜLLER	M	1971	GER	Bike und Radsport Langweid	18.07	2:34:06
18.	22	Thorsten WEINGART	M	1974	GER	MTB-Team-Schaumburg	18.07	2:37:02
19.	1268	Thomas SCHIEGL	M	1986	AUT	eldoRADo Biketeam	18.07	2:38:13
20.	1244	Andreas GERHAEUSER	M	1966	GER	BAD HEILBRUNN	18.07	2:39:43

2-2.4 API

What APIs in RACE RESULT 12 can do:
[Knowledge Base: Simple API]

The **simple API** function of RACE RESULT 12 makes it easy to build interfaces with third-party tools.

The event has its own registration platform, pushing new participants live to RACE RESULT 12 via Simple API. The Global-Sportservice team has also developed an add-on to address a specific requirement of the data processing in this event file, duplicating the start detections in different timing points.

2-3 Registration & Race Numbers Handling

The participants can sign up on **www.salzkammergut-trophy.at**. They choose whether they want to compete in the **MTB**, **Gravel**, **eMTB** or a separate **running** competition.

The **race pack** with the race number can be picked up at the tourist offices and bike shops in the region. Global Sportservice created a Simple API in RACE RESULT 12 to let the organizer update participant data and assign race numbers. The starter package can also be sent by post with a two-week lead time, in which case athletes receive a personalized race number.

The MTB race numbers have a **RACE RESULT Passive Transponder** attached to the back. They are mounted to the handlebar with cable ties. Participants can use their race number throughout the whole period of the event and compete as often as they want to.

MTB Plate with RACE RESULT Passive Transponder on the backside

Shipping Service for Race Numbers

RACE RESULT can send **race numbers** individually to the participants of the event.
whenever they way to and you avoid gatherings of athletes at the event. We can add additional event supplies to the shipment, such as **race documents**, **medals**, **shirts** or **sponsorship material**. We can also provide personalized race numbers printed with individual assigned start times for each participant. For details and conditions, contact us at **info@raceresult.com**. We are happy to help!

3 The Outcome

Apart from the fact that the direct face-to-face competition of a common race is not possible with this year's edition, the participants still get the **full service**. All **results** are available online and can be compared. The **race pack** with a few extras is handed out to every participant - this also gives the sponsors good visibility.

Even if the overall number of participants will likely be lower than in previous years, the organizer has proven that they can still offer customers the best possible race experience. More than 800 participants were registered at the time of publication of this case study, with the event lasting another three months.

An additional benefit of the new format is that the event does not take place on only one weekend, but that tourists can **register spontaneously** throughout the summer season.

Running event

With the new experience this year, the organizer has decided to add **two running courses**, **4.6 km** and **13 km** long. Global Sportservice also installed a permanent timing setup there.

Participants can sign up separately for this event and will receive a bib with integrated transponder.
All runners can start with the same bib as often as they like until the end of October and thus improve their time or join in at different distances.


salzkammergut trophy 2020

Willi ECKSCHLAGER

Salzkammergut Cycling Team

AUT

	Stage	Strecke A	Strecke B	Strecke C	Strecke D	Strecke E	Strecke F	Strecke G
KTM	Stage A	40:39	00:00	-	-	-	-	-
GARMIN	Stage B	17:07	00:00	-	-	-	-	-
BOSCH	Stage C	18:48	-	-	-	00:00	-	-
VKB BANK	Stage D	49:36	-	-	38:51	00:00	-	-
ENERGIE AG	Stage E	37:21	-	-	-	-	27:17	00:00
MAXXIS TIRES	Stage F	50:41	00:00	00:00	-	-	-	-
OÖNachrichten	Stage G	33:17	00:00	00:00	-	-	-	-
	Total	4:07:29	-	-	38:51	-	27:17	-

Individual Results as pdf

3-1 Online Results

As soon as a participant has completed all timed segments (stages) of a course, they **results are published online**. A mobile-friendly website allows to access leaderboards, sorted by category, gender and course. Each participant can see their individual segment times.

A **certificate** is available as PDF download.
If a participant completes the course again, the system checks weather he has a new personal best and overwrites the former result.

Find the results page here:
[Salzkammergut Trophy results]

3-2 Race Day

Thanks to compliance with the local COVD-19 regulations, it was even possible to organize a **smaller race day**. On July 18, pre-registered participants could ride one course with an individual start time.

Since there were **three starting locations** and **different starting times**, riders were spread over many kilometers in the region and the organizer was able to rule out the possibility of larger groups forming. An announcer coordinated the individual starts with a distance of 50 meters (approx. 15 seconds) between each participant. Each participant received their exact start time in advance via **SMS**.

The organizer offered **additional services**, such as info points, start area with arches and simple aid stations. Course marshals were placed at the beginning and end of each timed stage and at critical points along the route. Again, **sponsors** were given the opportunity to present themselves.

Increase the visibility of your event brand

Even a small race day can significantly increase visibility in the press and on social media platforms which help to strengthen the event brand. Especially in such challenging times, where few events take place, the positive examples attract a lot of attention.

An article on the first race day of the Salzkammergut Trophy can be found here: **[Bikeboard Magazine]**

3-3 Timer's Perspective

"Very early during the initial Corona lockdown in Austria, I kept close contact to all our customers and informed them about our decision to waive all cancellation fees, so they do not need to worry about any costs regarding the timekeeping of their events, due to cancellations. During such a call with the organizer of the Salzkammergut Trophy, I was asked if I could come up with a solution in order to time participants in an **individual single start** setup for the month of July (which is now July to October).
The participants should be able to race the course at their own discretion.

Since we would be using RACE RESULT systems for the actual event, I reached out to RACE RESULT CTO Nikias Klohr regarding the possibility to receive early access to the Track Box Passive. I also spoke to him about the boxes' power consumption to estimate the size of an autonomous small battery powered solar system to be able to run the systems off the grid. Nikias, always up for a challenge, immediately ordered solar panels and started testing. He **redesigned** some parts of box and came back to me with the solution to directly connect a **solar panel**.

Mario Persch, executive partner Global-Sportservice GmbH

We immediately started testing and had enough confidence to start the installation in early June. As with every new product we encountered some challenges and unexpected issues. But with the excellent working relationship with RACE RESULT, especially Nikias' technical expertise and our unconventional approach to problem solving, we overcame all obstacles in an incredibly fast pace. We were able to open the course for the participants on July 1st.

The actual installation of the systems was done in close cooperation with the organizer, who also provides an employee on site for the installation and possible maintenance. Challenges we were facing was to cause the minimum environmental impact, cell phone coverage, enough sun light and the protection from wildlife. We developed a tool which alerts us if e.g. in case we lose power at a device or the device is offline for a long time. Both happened: At a shack, someone unplugged the (clearly labeled) power supply to operate a wrench; one system did not have cell phone reception for 24 hours but did send all passing data after that.

The daily routine for us is to monitor if all systems have cell phone reception, the charging state of the batteries and when the last passing took place at each checkpoint. Since the start and finish are at different places and the course is different from what the participants are used to, we also deal with participant inquiries."

Mario Persch

Employee during Track Box Passive installation

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