

# TestForum 2021

Tuesday, November 30<sup>th</sup> and Wednesday December 1<sup>st</sup>, 2021

**Radisson Blu Scandinavia Hotel, Gothenburg, Sweden**

*A Nordic event for exchange of experience and know-how  
within the field of production test of electronics.*

*Meet colleagues and experts, gain knowledge about trends  
and best practices in the area of test of electronics.*



**TestForum 2021 November 30<sup>th</sup> and December 1<sup>st</sup> Gothenburg, Sweden**

Dear Invitee,

For test engineers in the electronics industry, TestForum, organized by Nordic Test Forum, is the yearly event, where you and others in the test community can get access to best practices in test engineering, exchange of ideas, networking, alternative approaches and news from test conferences and workshops worldwide blend in a constructive and inspiring manner. TestForum 2021, this year in Gothenburg, Sweden, is no exception. We have set up a balanced program, focusing on test strategies, test quality, structural test including JTAG testing, test automation, functional test, including fixturing and test interfaces and garnered with other mixed approaches in test engineering. Few places and opportunities in the world allow you the same direct and essential access to knowledge in test engineering.

Covid-19 has for a long period prevented us to get in direct contacts with colleagues, suppliers, experts, and others in the test community to ensure efficient networking. However, now after a difficult period we finally can meet again under safe conditions. Zoom and Teams meetings are OK, however, meeting real people after all puts an additional dimension to knowledge exchange. Do not miss this great opportunity to enhance your knowledge on the latest developments in the test community and in approaches that make you and the company you work for to get back into the forefront of productivity, test engineering and optimum ways of operating in the test environments

This year's Keynote talk will be given by Peter Thorngren from Volvo Trucks, a world leader in the largest medium to heavy-duty truck brands in the world. Part of the Volvo success is quality in products and test engineering. Peter Thorngren will share with us the journey to success in a world market, where automotive and hence quality of automotive electronics play an essential role.

At the end of the first day, we will have an interesting panel discussion on the topic: *"How do we ensure access to test engineers and competences in a world, where human resources these years are in need, and other sectors often tend to be favored by young people"*. Practices in test program development and maintenance are very different from company to company, and from business segment to business segment. We aim to have experienced panelist share with us, how they see optimum approaches in development of and access to people in this vital part of test engineering.

TestForum 2021 will offer many other opportunities to enrich your personal insight and knowledge in the latest developments in test engineering in electronic.

Hence, I invite you to an interesting and inspiring event in practical test engineering. As usual in Test Forum events, networking is another important facet and during breaks and meals you will have great opportunities for technical and business discussions. The mini exhibition at TestForum offers yet another element of learning more about opportunities to improving your company's approach in quality engineering.

On behalf of the program committee, I am looking forward to seeing you at TestForum 2021 in Gothenburg on November 30th and December 1st, 2021

Yours sincerely



Knut Båstøløkken  
Chairman of Nordic Test Forum

**Keynote Speaker**

Peter Thorngren,  
**Technology and Strategy Leader at Volvo Group**



Peter Thorngren has a background in a number of different business areas (Bank, Internet, Smartphone and Automotive) since the early 80s. He has worked as developer, integrator, tester, project/technical leader and as an entrepreneur. The work focus has been on embedded and Internet related areas. He has been working with trucks at Volvo since 2007 and was the assigned global verification leader for electrical systems in all the major Truck launches during 2012-13. Peter works today as technical leader/specialist with a focus on integration and verification in SIL, MIL, HIL and "BIL" environments. Automation and virtualization are the core activities. Peter regularly presents at different international conferences related to embedded, verification, integration and automotive.

## **Nordic Test Forum in Brief**

*TestForum* is an annual event that *Nordic Test Forum (NTF)* runs every fall/early winter. *TestForum* typically has 3-thematic areas and cover a broad balance of test and inspection.

*TestForum* has its roots back the late eighties, where it originated as an event for the Norwegian electronics industry. However, from the late part of 2001 a group of people from Norway, Sweden and Denmark established the network, *Nordic Test Forum*. Later, this activity (including the *TestForum* event) was extended to include all the Nordic countries. The language of the official presentations is English. Content and focus of the *TestForum* varies over time, but always within topic areas in focus at a given point in time.

*TestForum* has its main emphasis on issues relevant to production managers, engineers and technicians working in the fields of production, test, inspection, and validation of electronics. At *TestForum* events we offer technically relevant presentations on methodology, tools, modules/instruments, and available technology. The interaction between users and suppliers within the focus areas is an important asset of *TestForum*, and this balance and interaction is pursued in presentations, panel discussions, and in the planning of the events.

### **TestForum Aims at:**

- Creating and sustaining a relevant, balanced, and coherent interaction between users as well as between users and suppliers of solutions for test, inspection, validation, and production of electronics.
- Providing an up-to-date view on new methodologies and tools for relevant test, inspection, validation, and production of electronics.
- Establishing a relevant and balanced view on equipment, systems, tools, and software from tool vendors in the domain.

### **Target Audience of TestForum**

Engineers and technicians, managers, and planners within the fields of electronics production and test, inspection, and validation. Also includes decision makers in organizations that procure equipment, tools and systems for production and test, inspection, and validation of electronics.

### **Executive Committee of TestForum event and NTF organization**

Knut Båttstøløkken	Kitron AS, Norway (Chairman)
Birger Schneider	CHAMAJ, Denmark (Treasurer)
Bjørn B Larsen	NTNU, Norway (Secretary)
Artur Jutman	Testonica Lab, Estonia
Erik Larsson	Lund University, Sweden
Lars Kongsted-Jensen	EP-TeQ A/S, Denmark
Mats Klarholm	Columbia Elektronik, Sweden
Mattias Ericsson	AddQ, Sweden
Mick Austin	JTAG Technologies, Finland
Mika Pussinen	Nokia, Finland
Paulius Musteikis	UAB Kitron, Lithuania
Raimedas Sodaitis	EP-TeQ UAB, Lithuania
Stig-Gunnar Jensen	Eltek AS, Norway
Thomas Goetz	Keysight Technologies (associate member), Germany

## **Become a Member of Nordic Test Forum**

If you are involved in production test, validation test, and inspection of electronics and your professional work is related to activities in the Nordic countries as a test professional, design engineer, manufacturer, supplier of solutions, consultant, etc., you may register as member of Nordic Test Forum (NTF) to benefit from:

- Exchange of know-how in testing
- Increased contact network in the Nordic countries
- Surveillance and information of international activities in the area of test and inspection
- Discounts at NTF seminars and TestForum events
- Membership list

Please register on the WEB page: <http://www.NordicTestForum.org>

## **TestForum 2021 Local Organizer**

The local organizer is:

**Mattias Ericsson**  
AddQ  
Odinsgatan 11  
411 03 Gothenburg  
Sweden

Phone: +46 735 14 21 89  
E-mail: [mattias.ericsson@addq.se](mailto:mattias.ericsson@addq.se)

## Technical Program of TestForum 2021

### Nordic Test Forum (NTF) Annual Assembly, November 29<sup>h</sup> 2021

The NTF organization holds an annual general assembly a day before the TestForum conference. This year it will be held on **November 29<sup>th</sup> at 20:00**. The agenda and motions will be dispatched to the members in a separate mailing.

The official program of TestForum 2021 starts on Tuesday, November 30<sup>th</sup>, 2021, see below.

### Tuesday, November 30<sup>th</sup>, 2021

Time	Titles	Speakers or additional info
08:30-08:50	Registration	
<b>08:50-09:00</b>	<b>Welcome / Introduction</b>	Knut Båtstøløkken
<b>09:00-09:30</b>	<b>Exhibitor Forum: short presentations</b>	<i>Chairman: Mick Austin</i>
<b>09:30-10:30</b>	<b>Session 1: Test software</b>	<i>Chairman: Stig-Gunnar Jensen</i>
09:30-10:00	Moving to open-source software in test automation	Göran Johnsson, GJC Test & Software
10:00-10:30	Future of Hardware Test Automation Software	Sreejesh Nair, exsensio
10:30-11:00	Coffee Break / Exhibition	
<b>11:00-12:30</b>	<b>Session 2: Test Strategies, test system design</b>	<i>Chairman: Stig-Gunnar Jensen</i>
11:00-11:30	How to optimize your design and your test using today DPMO?	Christophe Lotz, Aster
11:30-12:00	Building State of the Art T&M systems	Hakon Risbakk, CN Rood
12:00-12:30	AI automated root cause analysis	Christian Schöpf, QualityLine
12:30-13:30	Lunch	
<b>13:30-15:00</b>	<b>Session 3: Structural Test</b>	<i>Chairman: Mattias Ericsson</i>
13:30-14:00	Challenges in making 3D Automatic X-ray Inspection (AXI) of large boards	Andreas Türk, GÖPEL electronic, AXI
14:00-14:30	How to do Online Training like typical ICT System inhouse training	Lothar Diez, SPEA
14:30-15:00	Future technology trends and test challenges	Frank Grossmann, ATEip GmbH
15:00-15:30	Coffee Break / Exhibition	
<b>15:30-16:30</b>	<b>Session 4: JTAG Based Test</b>	<i>Chairman: Erik Larsson</i>
15:30-16:00	Embedded Diagnostics for Test	Reg Waller, Asset
16:00-16:30	Embedded ISP - Mixing Embedded Test with ISP using unified ATE integrated instruments	Jan Heiber, GÖPEL electronic GmbH
16:30-17:00	IEEE 1687 update (Virtual presentation)	Martin Keim, Siemens EDA (Mentor)
17:00-17:30	Fruit & Refreshments / Exhibition	
<b>17:30-19:00</b>	<b>Panel debate:</b>	<i>Panel moderator: Birger Schneider</i>
	<i>"How do we ensure access to test engineers and competences in a world, where human resources these years are in need, and other sectors often tend to be favored by young people".</i>	
<b>19:30</b>	<b>Dinner</b>	

**Wednesday, December 1<sup>st</sup>, 2021**

Time	Titles	Speakers or additional info
<b>09:00-10:00</b>	<b>Key Note Session</b>	<i>Chairman: Knut Båstoløkken</i>
09:00-10:00	Testing and observability in mechatronic autonomous system. Why fast development loops using Build, Measure and Learn in so critical and Fun!	Peter Thorngren, Volvo Trucks
<b>10:00-10:30</b>	<b>Session 5: Automotive test</b>	<i>Chairman: Mats Klarholm</i>
10:00-10:30	Challenges in testing modern electronic vehicle network architectures	Michael Schmidt, GÖPEL electronic, ATS
10:30-11:00	Coffee Break / Exhibition	
<b>11:00-12:30</b>	<b>Session 6: Fixturing and test interfaces</b>	<i>Chairman: Paulius Musteikis</i>
11:00-11:30	ODU – reliable test interface solutions for demands of tomorrow	Kenneth Pedersen, ODU
11:30-12:00	When test of electronics requires mechanical solutions	Per Pedersen, Mekan
12:00-12:30	Eliminating Cables from Modular ATE Systems	Gary Clayton, MacPanel
12:30-13:30	Lunch	
<b>13:30-15:00</b>	<b>Session 7: Mixed session</b>	<i>Chairman: Lars Kongsted-Jensen</i>
13:30-14:00	High Volume solution for highly panelised PCBA in Automotive and IOT Applications	Thomas Goetz, Keysight
14:00-14:30	In-System Programming universal guidelines: application and common standards	Giulio Zannier and Ivan Liberotti, SMH Technologies
14:30-15:00	High quality assurance level of EV Batteries with use of X-ray and CT	Dr. Tobias Neubrand, Waygate
15:00-15:10	Closing Session: TestForum concluding remarks	<i>Knut Båstoløkken Kitron</i>

## Exhibition

As part of TestForum 2021, a mini exhibition takes place in frames of the TestForum event. Here, test equipment and solution vendors as well as other essential suppliers to the test community present their tools and methodologies related to production test.

Exhibitors can make arrangements with NTF about exhibition space. If no special requirements have been requested, a table of about 60x120 cm<sup>2</sup>, as well as space for posters or similar material will be provided.

Every exhibitor will be given 3-minute slot in the beginning of the official program for a brief introduction with maximum 3 slides. We call it the “elevator speech”, where the presenter in the time of a normal elevator ride has to get the essentials of a company’s offerings across to the attendee community.



## Registration and hotel booking

The **Conference Fee** is **EUR 450 for NTF members, EUR 250 for students** and **EUR 525 for others**. The fee includes participation, food and refreshments from Tuesday morning to Wednesday afternoon as well as forum proceedings on a USB memory stick. **Exhibitors pay EUR 850**, which also includes the participation of a single person.

The seminar fee will be invoiced directly to the organization, from which the participant comes. In the event of cancellation after the final registration date, or in the event of failure to appear, the entire fee is still due. On request, another person from the same organization can participate instead.

### Registration deadline:

**Sunday 14<sup>th</sup> November, 2021**, is the latest time of registration, if you want to be guaranteed a hotel room at the conference hotel. **Registration after this date is also possible**. However, we cannot guarantee that hotel rooms are available at the conference hotel.

Registration for TestForum 2021 can be done through the NTF website by using the following link.

- <https://testforum.nemtilmeld.dk/2/>

Alternatively, you can contact the TestForum secretariat at

Att.: Jytte Schneider  
Tel.: +45- 2579 1120  
Email: [jytte.schneider@nordicestforum.org](mailto:jytte.schneider@nordicestforum.org)

Please indicate, whether you register as:

- |   |         |
|---|---------|
| • NTF member  | EUR 450 |
| • A non-member  | EUR 525 |
| • A student (with valid student ID)                           | EUR 250 |
| • An exhibitor, i.e., want to exhibit in the small exhibition | EUR 850 |

## Booking of hotel rooms

The hotel rooms are booked through the conference hotel. Radisson Blu Scandinavia Hotel, Gothenburg, directly on their website:

<https://www.radissonhotels.com/en-us/hotels/radisson-blu-gothenburg-scandinavia>

The room rate is paid directly by each participant to the hotel (i.e. not included in the seminar fee). Room rates are:

- **1.495 SEK/night Single room** (apx. **147 EUR**), including breakfast.
- **1.695 SEK/night Twin/double room** (apx. **167 EUR**), including breakfast.

When making the booking on the Radisson Blu hotels website use the booking code: **TestForum** to receive the preferred rate at the hotel.

Booking of rooms at the conference hotel is **not** mandatory for participation at the seminar.



## Radisson Blu Scandinavia, Gothenburg, Sweden

TestForum 2021 will take place at Radisson Blu Scandinavia, which is situated in downtown Gothenburg. Our city center location places you right across the street from excellent shopping at Nordstaden Mall, as well as Central Station, which makes it easy to explore this beautiful city.



More details about the hotel at:

<https://www.radissonhotels.com/en-us/hotels/radisson-blu-gothenburg-scandinavia>

### How to get to the Radisson Blu Scandinavia Hotel

#### Södra Hamngatan 59, Gothenburg S-401 24, Sweden

Located across from the Central Station provides guests with easy access to the airport bus, train and tram connections. Landvetter Airport is a quick 25-kilometer trip away.

The hotel is within walking distance of attractions of Gothenburg such as the Garden Society of Gothenburg, the Gothenburg Cathedral and Vasa Park. The hotel offers a private, secured garage to park your car.

Gothenburg is well accessible by plane, ferry, train, and bus. Below we summarize the most common ways to reach the city. However, for the most up to date travel hints and tourist information.

#### From Gothenburg-Landvetter Airport (GOT)

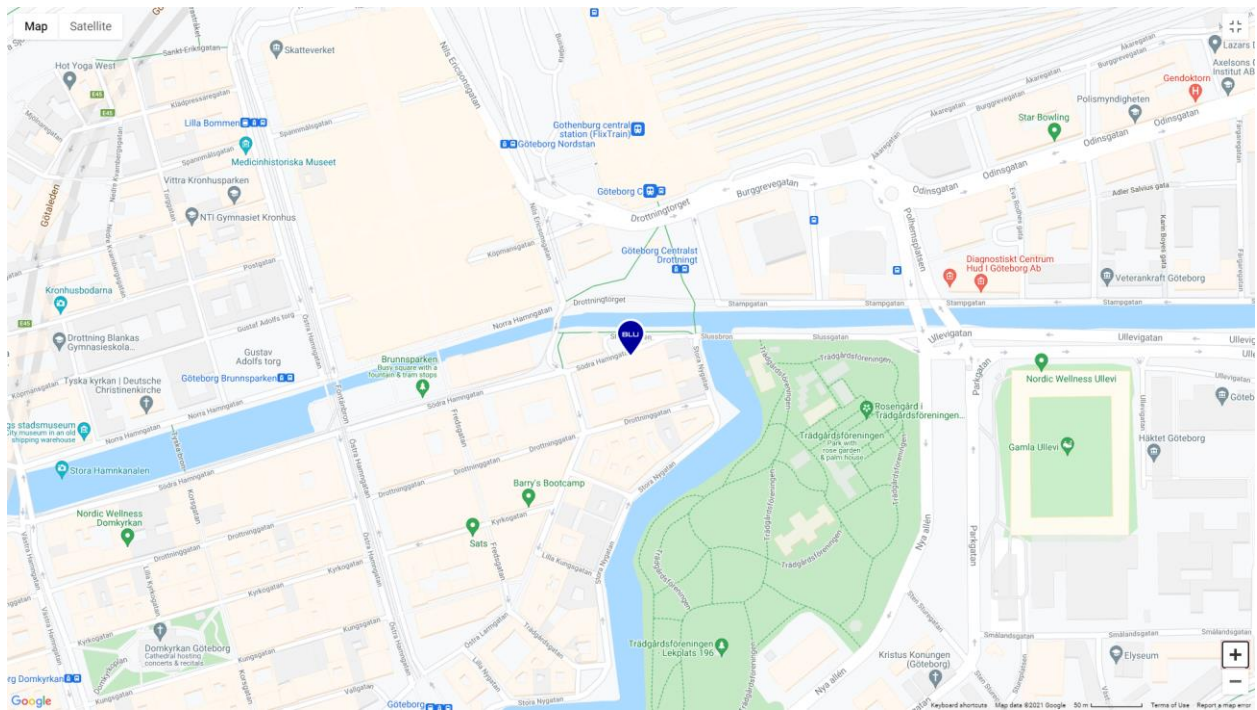
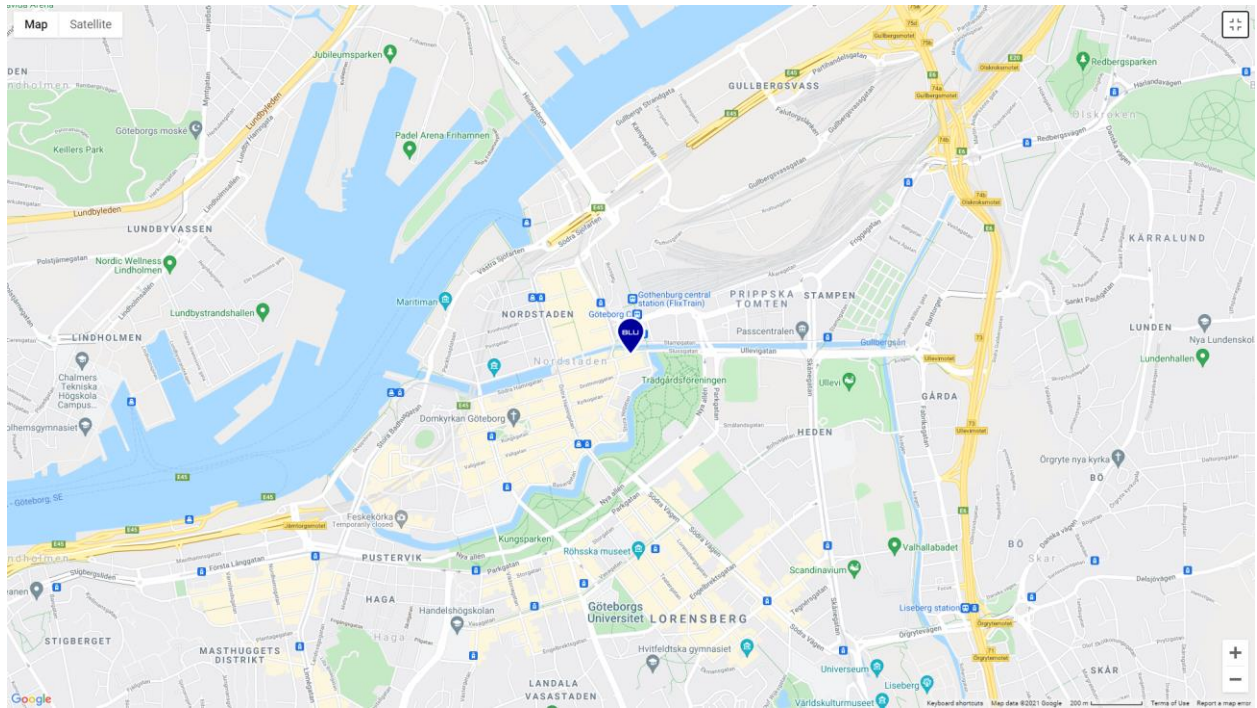
**By bus:** Take bus "Flygbussarna" toward Göteborg's "Nils Ericsonterminal" and exit at Göteborg Kungssportsplatsen. Walk through Östra Larmgatan, turn right onto Södra Hamngatan and you will reach the hotel (450 meters from the bus stop). Travel times is approximately 20 minutes.

**By car:** The hotel is located across the street from Gothenburg Central Station. Motorists can take the Ullevi turn from the E6 and follow signs toward centrum. At the third traffic light, drive straight and follow the signs toward Brunnsparken along the canal, about 300 meters. When the road veers toward the left (directly after a small bridge), keep driving forward, and the hotel will be on your left hand side.

#### From Ferry Terminal Gothenburg

**By bus:** Ferries arrive in Gothenburg from Kiel, Germany and Frederikshavn, Denmark. From the terminal take bus number 50 towards Kalleback. Exit at Göteborg Brunnsparken and walk 190 meters to the hotel entrance.

**By tram:** Walk 400 meters to the tram stop Göteborg Järntorget and take trams 1, 6 or 9. All of them stop at Göteborg Brunnsparken. The hotel is a 2-minute walk from the stop.



## Welcome to Nordic Test Forum in Gothenburg 2021