

TestForum 2022

Tuesday November 29th and Wednesday November 30th, 2022

Scandic Ambassadeur, Drammen, Norway

*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 2022 November 29 and 30th Drammen, Norway

Dear Invitee,

On behalf of the Nordic Test Forum committee, it is my pleasure to invite you to Scandic Ambassadeur, Drammen, Norway to the annual NTF conference, TestForum 2022. Drammen is located close to Oslo about 1 hour by direct train from Oslo Airport, Gardermoen, or by taxi or car.

Again, this year, we have managed to put together an excellent technical program for TestForum, focusing on test automation, test strategies, test quality, structural test, functional test and JTAG based test. The Keynote focusses on data analytics. The day 1 technical program ends with a panel session on future trends in electronics test. No question that the topic is one of the hot issues for many of us in test engineering in present years.

Among the presenters, we find experts from Austria, Denmark, France, Germany, The Netherlands, Norway, Sweden, and USA.

This year's Keynote speaker is Stian Haugen, Chief Technology Officer at Kitron group. The title of the keynote is "Benefits of data analytics in manufacturing"

The conference, the conference dinner and the mini exhibition offer great opportunities for technical and business discussions and networking.

On behalf of the program committee, I am looking forward to seeing you at TestForum 2022 in Drammen on November 29th and 30th, 2022

Yours sincerely



Knut Båstøløkken
Chairman of *Nordic Test Forum*

Keynote Speaker

Stian Haugen,
CTO at Kitron Group



Stian Haugen was born in 1976 on a small Norwegian farm. His passion for creative solutions and finding hidden opportunities became strong early. Stian spent a lot of time building innovative machines and solutions for various mechanical and electrical devices before computer science and programming became his interest.

Stian joined Kitron Group in 2013 after several years of working in the mobile industry. He started by managing the technology department of Kitron in Arendal, Norway. Later on, he became the CTO of Kitron Group. He also has extensive experience in international R&D and customer support and holds a B.sc in computer science from Agder University, Norway.

The journey with Kitron has been fantastic, growing from a 1,5BNOK company in 2013 to an almost 6BMNOK company in 2022. This means a constant need to adapt to new challenges, but the Kitron team only shows how successful they are at it.

One of the highlights of 2022 is Kitron's acquisition of BB Electronics. It means even more capabilities, an extended global footprint, and more value for our present and future customers.

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 Båststøløkken	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, 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 2022 Local Organizer

The local organizer is:

Stig-Gunnar Jensen

Eltek

Gråterudveien 8

NO-3036 Drammen

Norway

Phone: +47-416 63327

E-mail: stig-gunnar.jensen@eltek.com

Technical Program of TestForum 2022

Nordic Test Forum (NTF) Annual Assembly, November 28^h 2022

The NTF organization holds an annual general assembly a day before the TestForum conference. This year it will be held on **November 28th at 20:00**. The agenda and motions will be dispatched to the members in a separate mailing.

The official program of TestForum 2022 starts on Tuesday, November 29th, 2022, see below.

Tuesday, November 29th, 2022

Time	Titles	Speakers or additional info
08:30-08:50	Registration	
08:50-09:00	Welcome / Introduction	Knut Båtstøløkken
09:00-10:00	Key Note Session	<i>Chairman: Knut Båtstøløkken</i>
09:00-10:00	Benefits of data analytics in manufacturing	Stian Haugen, CTO, Kitron ASA
10:00-10:30	Exhibitor Forum: short presentations	<i>Chairman: Mick Austin</i>
10:30-10:45	Coffee Break / Exhibition (short)	
10:45-11:45	Session 1: Structural Test I	<i>Chairman: Stig-Gunnar Jensen</i>
10:45-11:15	'Elektrische Fotografie' (electrical image) - update	Frank Grossmann, ATEip GmbH
11:15-11:45	How to do On Board Programming on ICT Systems	Lothar Diez, SPEA
11:45-12:00	Short break / Exhibition	
12:00-13:00	Session 2: Structural Test II	<i>Chairman: Artur Jutman</i>
12:00-12:30	Increasing In Circuit test Coverage	Bernard Fleck, Teradyne
12:30-13:00	AXI automatic X-ray inspection - compact knowledge for beginners	Andreas Türk, GÖPEL electronic, AXI
13:00-14:00	Lunch	
14:00-15:00	Session 3: Mixed session I	<i>Chairman: Paulius Musteikis</i>
14:00-14:30	Trends and challenges of testing wireless IoT products in high-volume production	Rebecka Erntell and Niklas Gustafson, Mikro dust AB
14:30-15:00	Production Test Optimization with Rotary Test Handler	Pol Talo, 6TL
15:00-15:30	Coffee Break / Exhibition	
15:30-16:30	Session 4: Quality and analysis	<i>Chairman: Raimedas Sodaitis</i>
15:30-16:00	Six Sigma for test engineers	Mads Dahl, Virinco
16:00-16:30	Creating total end-to-end control to maximize manufacturing yield and quality	Eyal Kaufman, QualityLine
16:30-17:00	Test point optimization using Digital Twin	Christophe Lotz, Aster Technologies
17:00-17:30	Fruit & Refreshments / Exhibition	
17:30-19:00	Panel debate: Trends in future of electronics test	<i>Panel moderator: Birger Schneider</i>

Wednesday, November 30th, 2022

Time	Titles	Speakers or additional info
09:00-10:30	Session 5: Mixed session II	<i>Chairman: Erik Larsson</i>
09:00-09:30	Power conversion test advancements with SiC technology	Teit Poulsen, Altoo / 4Test
09:30-10:00	AI Support of Sound - Development & Test	Birger Schneider, Chamaj
10:00-10:30	Knowledge and skill - the meaning of prediction in manufacturing	Dr. Kristin Vogelsang, Keysight
10:30-11:00	Coffee Break / Exhibition	
11:00-13:30	Session 6: JTAG Based Test / Test for EV sector	<i>Chairman: Mattias Ericsson</i>
11:00-11:30	Co-validation of Board level design and FPGA design using a unified platform solution	Jan Heiber, GÖPEL electronic GmbH, Embedded JTAG Solutions
11:30-12:00	Boundary Scan Performance Enhancements using JTAG Technologies & the Teradyne Boundary Scan Runtime	Alain Vervin, Teradyne Defense & Aerospace / Anthony Sparks, JTAG Technologies
12:00-12:30	TEST SOLUTIONS developed for the EV sector	Paolo Bertoldo, Seica
12:30-13:30	Lunch	
13:30-15:00	Session 7: Test Strategies and best practices	<i>Chairman: Lars Kongsted-Jensen</i>
13:30-14:00	Optimal utilization of instrument park	Bjørn Sveum, Rohde & Schwarz AS
14:00-14:30	WATS connect to the cloud	Vidar Grønås, Virinco
14:30-15:00	Test Strategies in Repair and Prototype manufacturing in times of component shortages	Hermann Reischer, Polar Instruments
15:00-15:15	Short break	
15:15-16:15	Session 8: Mixed session III	<i>Chairman: Mats Klarholm</i>
15:15-15:45	ICT with LED test / Artificial Intelligence (AI) solution for AOI & AXI	Anthony Wang, TRI Test Research Europe
15:45-16:15	The versatility of the Source Measure Unit	Filip Langenaken, CN Rood
16:15-16:25	Closing Session: TestForum concluding remarks	<i>Knut Båstoløkken Kitron</i>

Exhibition

As part of TestForum 2022, 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, as well as space for posters or similar material will be provided.

Every exhibitor will be given approximately 3-minute slot, depending on the number of exhibitors, 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 500 for NTF members**, **EUR 275 for students** and **EUR 575 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 900**, which also includes the participation of a single person.

Credit card is the preferred payment method. Alternatively, the seminar fee may 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:

We accept registrations up to Thursday November 24th, 17:00 CET.

Registration for TestForum 2022 can be done through the NTF website by using the following link.

- <https://testforum.nemtilmeld.dk/3/>

Alternatively, you can contact the TestForum secretariat at

Att.: Jytte Schneider
Tel.: +45- 2579 1120
Email: jytte.schneider@nordicestforum.org

Please indicate, whether you register as:

- | | |
|---|---------|
| • NTF member | EUR 500 |
| • A non-member | EUR 575 |
| • A student (with valid student ID) | EUR 275 |
| • An exhibitor, i.e., want to exhibit in the small exhibition | EUR 900 |

All fees are ex. VAT

Booking of hotel rooms

The hotel rooms are booked through the conference hotel. Scandic Ambassadeur Hotel, Drammen, directly on their website:

<https://www.scandichotels.com/hotels/norway/drammen/scandic-ambassadeur-drammen>

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

- **1.090 NOK/night Standard room** (apx. **109 EUR**), including breakfast.
- **1.290 NOK/night Upgraded room** (apx. **129 EUR**), including breakfast.

When making the booking on the Scandic Ambassadeur website use the booking code: BNOR281122 and make the reservation before November 11th to receive the preferred rate at the hotel.

Booking of rooms at the conference hotel is **not** mandatory for participation at the seminar. If you are unable to get a room at the conference hotel, there are several other hotels in the vicinity of the venue.

Scandic Ambassadeur, Drammen, Norway

TestForum 2022 will take place at Scandic Ambassadeur, which is centrally located in Drammen, within walking distance of the train station and the airport express train.



More details about the hotel at:

<https://www.scandichotels.com/hotels/norway/drammen/scandic-ambassadeur-drammen>

How to get to the Scandic Ambassadeur Hotel

Strømsø Torg 7, NO-3044 Drammen, Norway

The hotel is located 100 meters from Drammen station and provide guests with easy access to trains, including the airport express train (Flytoget) and bus connections. Oslo Airport Gardermoen is 93 kilometers away. Sandefjord Airport Torp is 78km away. Oslo Central station is 43 kilometers away.

The hotel is located by the water, a short distance from the beach. There are several beautiful park areas close by. The hotel offers a private, secured garage to park your car.

Drammen is well accessible by car, train, and bus. Below we summarize the most common ways to reach the city.

From Oslo Airport Gardermoen (OSL)

By airport express train (Flytoget):

The ride takes about one hour.

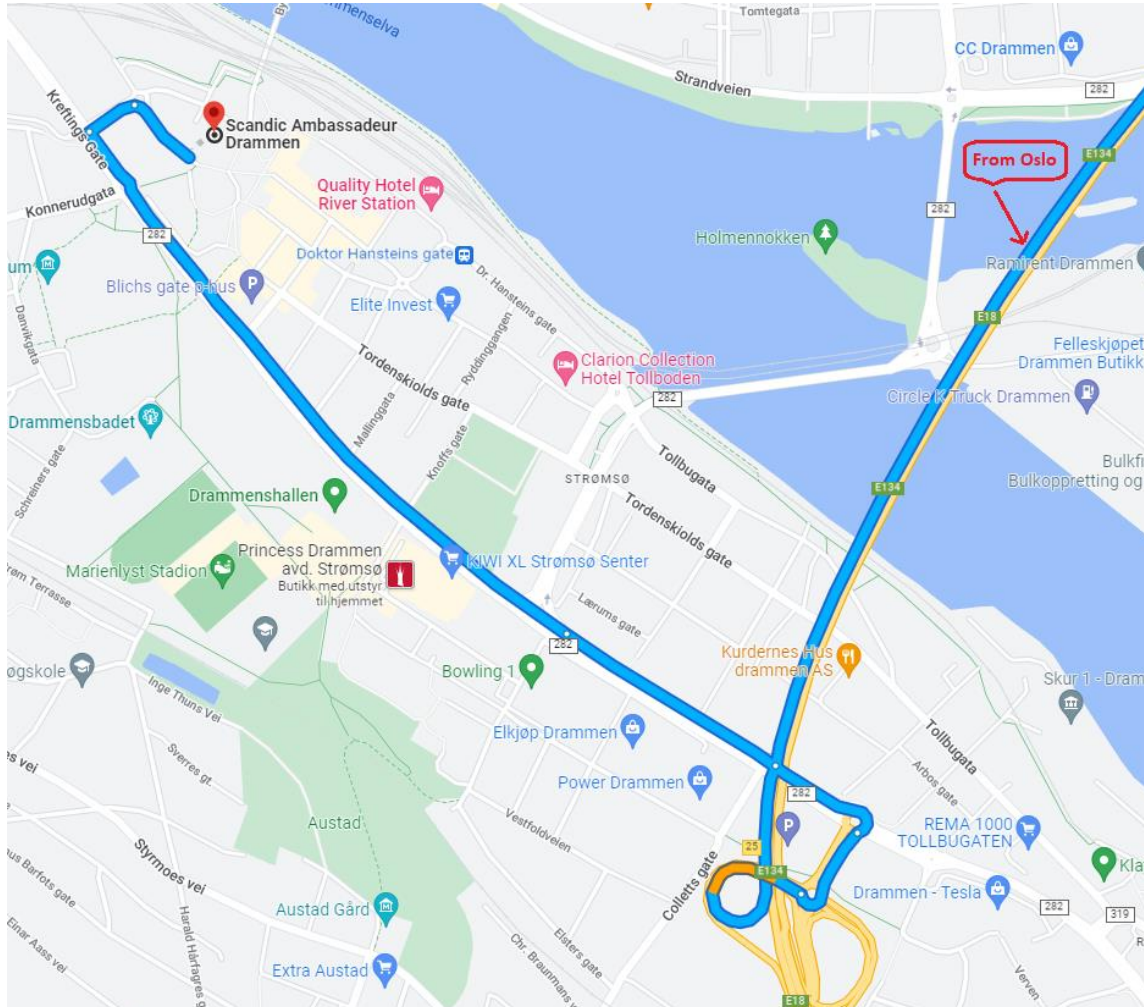
Please note that some departures ends at Oslo Central station and does not go as far as Drammen.

For departure times, tickets and other information visit <https://flytoget.no/en/>

By regional train:

You can use regional trains R10 Drammen, R11 Skien and L12 Kongsberg.

For departure times, tickets and other information visit <https://www.vy.no/en>

By car – direction from Oslo:**From Sandefjord Airport Torp (TRF)**

Sandefjord Airport Torp has direct connections to Copenhagen, London, Manchester, Amsterdam, Vienna, Tallinn, Vilnius, Warsaw, Krakow and other international destinations as well as several Norwegian cities.

For more information, see: <https://www.torp.no/en>

By train:

Torp train station is located 2.65 km from the airport. You can walk, take a shuttle bus or a taxi.

Use regional train R11 Eidsvoll.

For departure times, tickets and other information visit <https://www.vy.no/en>

By bus:

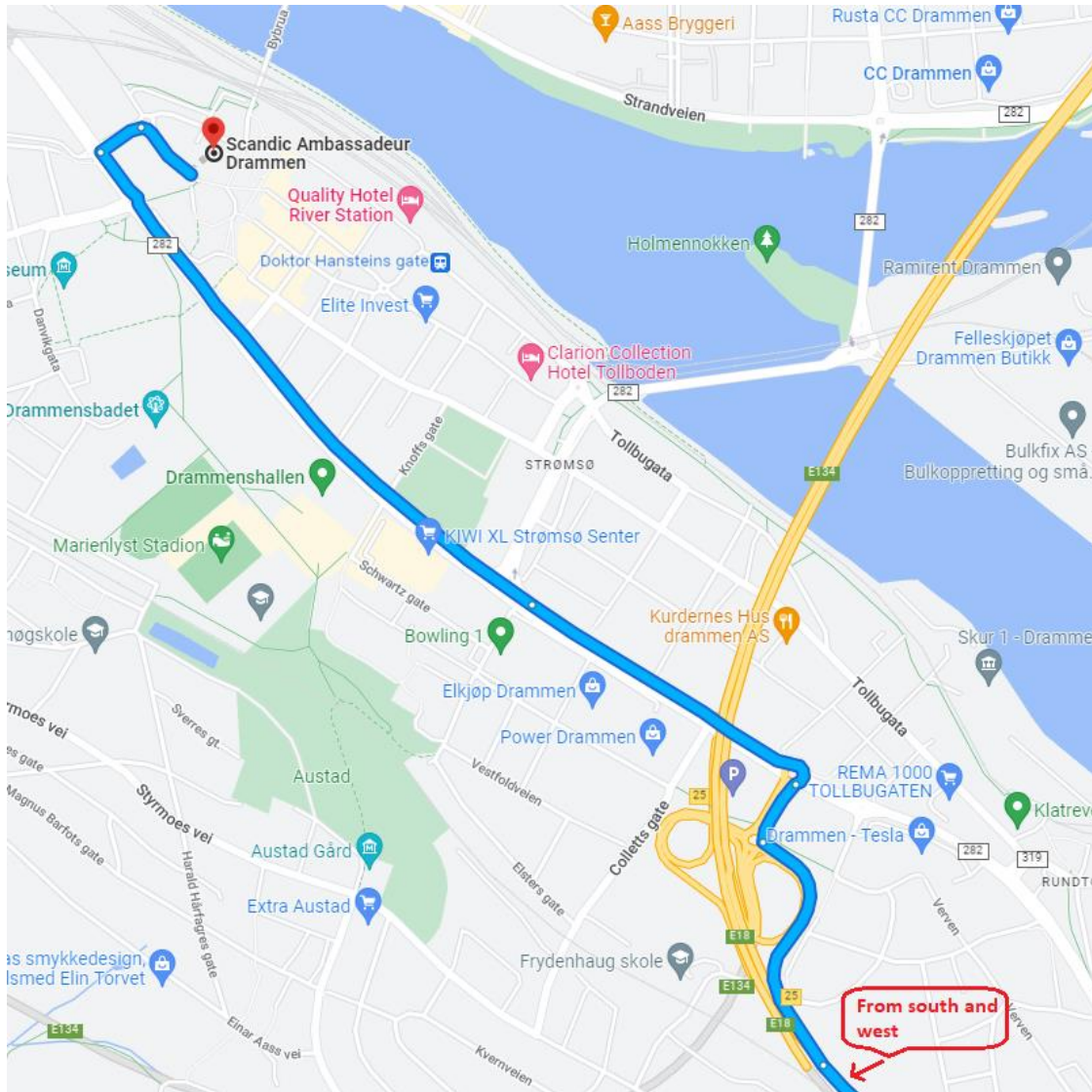
You can take 'Torp-Ekspressen' from the airport to Bangeløkka, Drammen. The ride is about one hour.

Please note that the distance between Bangeløkka bus-stop and the hotel is 1.5 km on foot, 1.9 km by car.

For departure times, tickets and other information visit <https://www.torpekspressen.no/en>

More bus alternatives are listed here: <https://www.torp.no/en/transport/bus>

By car – direction from south and west:



Ferries

There are several several ferry lines to destinations near Drammen. For more information, visit the ferry companies web pages:

- Copenhagen - Oslo <https://www.dfds.com/en>
- Fredrikshavn - Oslo <https://www.dfds.com/en>
- Kiel - Oslo <https://www.colorline.com>
- Strömstad – Sandefjord <https://www.fjordline.com/en>, <https://www.colorline.com>
- Hirtshals - Larvik <https://www.colorline.com>

Welcome to Nordic Test Forum in Drammen 2022