

NiWeek
**FUTURE
FASTER**

MAY 21–24, 2018, AUSTIN, TEXAS

From the Testers: Measuring for Energy Efficiency and Labeling

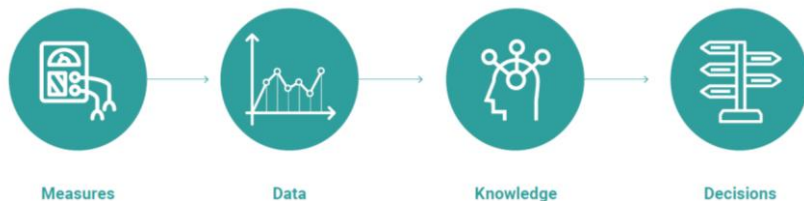


Gianluca Bacchiega – I.R.S. srl

R&D - Italy

**IRS group:
why, how, what**

Why?



It can be done better.

How ?



Innovation.

Increase customer value
generation going
beyond traditional solutions.

What?



**Think to your daily
life. Chances are
that you saw a
product tested
using our systems.**



**After Volkswagen scandal
energy efficiency compliance
is a critical test for 100% product**

Beyond Volkswagen scandal

Consumers in line for compensation over false appliance efficiency ratings

Tests find that high street brands of washing machines, TVs, dishwashers and other goods overstate their energy efficiency



A washing machine being loaded with laundry Photo: Alamy

<https://www.telegraph.co.uk/news/shopping-and-consumer-news/11938104/Consumers-in-line-for-compensation-over-false-appliance-efficiency-ratings.html>

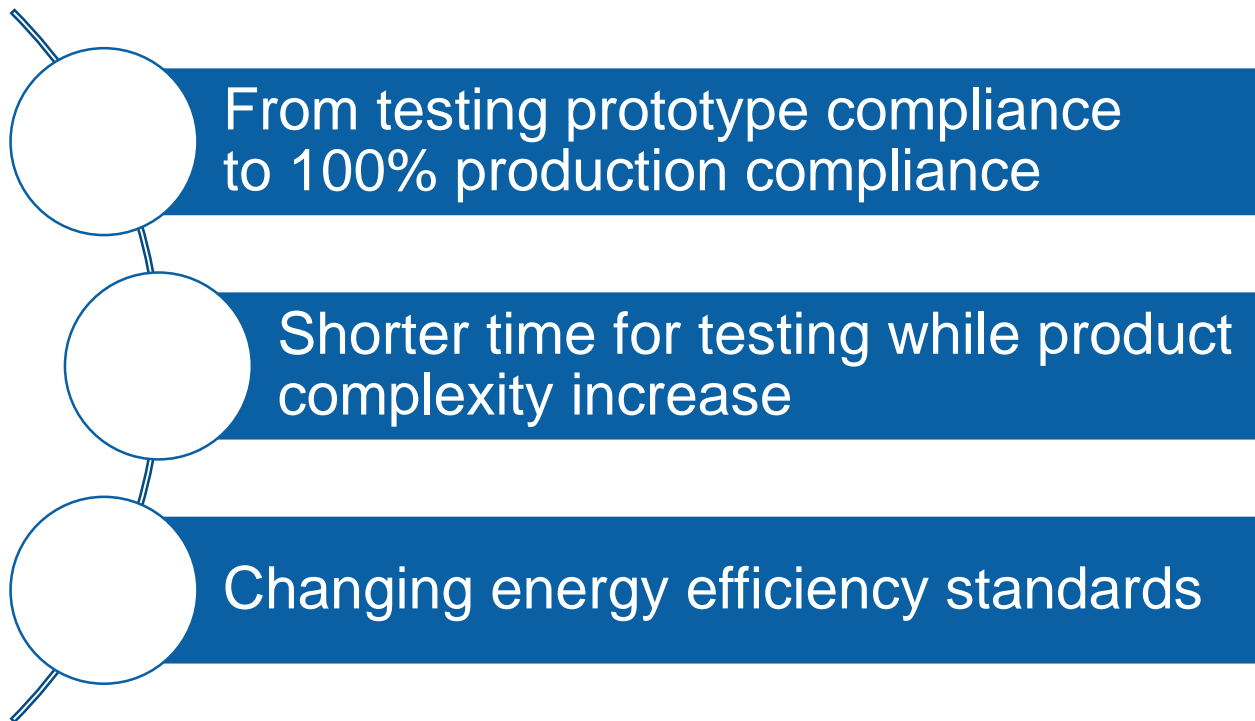


The New York Times

Beyond VW Scandal: Home Appliance Industry No Stranger to Tricks

<https://www.nytimes.com/2015/10/10/business/makers-of-consumer-products-have-long-history-of-cheating.html>

Challenges in testing for energy efficiency standard



From testing prototype in the lab to 100 % production

Laboratory

- A. Prototype
- B. Defined environment
- C. Accurate measurement

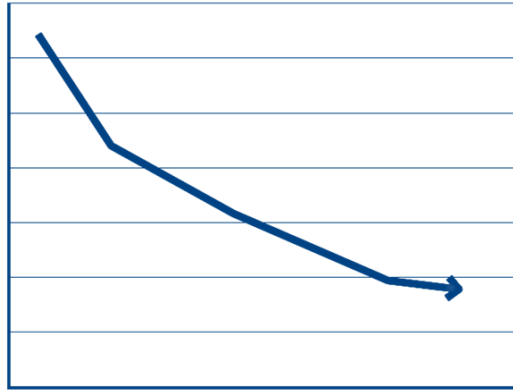


Production

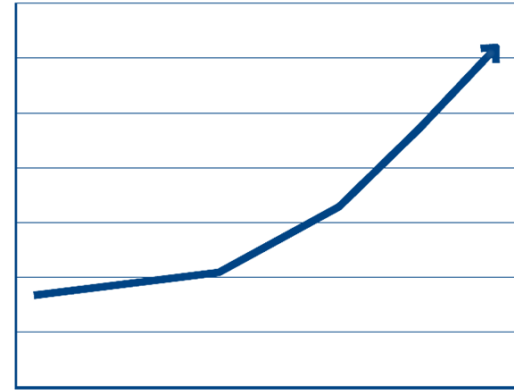
- A. All product
- B. Manufacturing environment
- C. Less sophisticated measurement

Shorter time for testing while product complexity increase

Time for testing



Product complexity



Diverse and changing energy efficiency standards

by country

Country / Region	Policy
European Union	Energy Efficiency Directive (EED)
United States	Superior Energy Performance (SEP) Program
China	Top 10 000 Enterprises programme
Indonesia	Ministerial Regulation on Energy Management

by types

- Prescriptive standards
- Minimum energy performance standards (MEPS)
- Class average standards

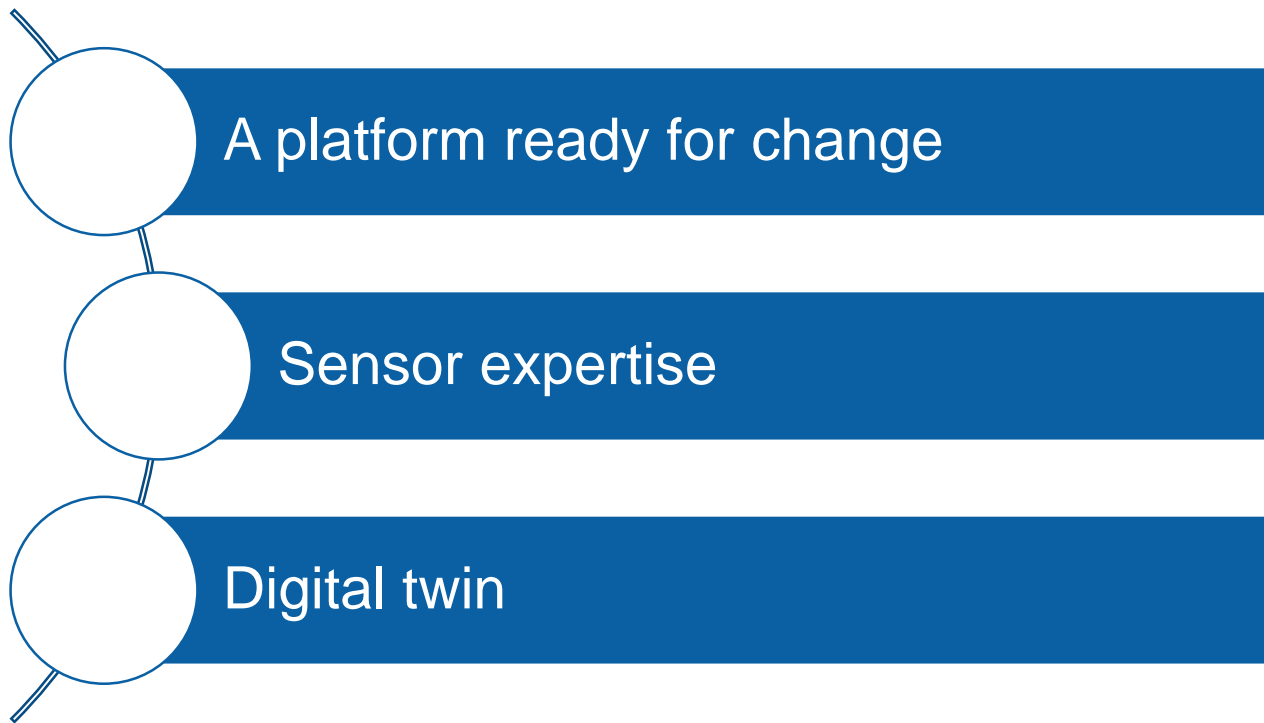
by public interest

New regulation push for real world utilisation
vs protocol test in laboratories

Technologies

Can answer to new challenges

Better testing for energy efficiency



National Instruments

A platform ready for change

A platform ready for change



Productive Software

Our extensive portfolio of software, from LabVIEW to TestStand, helps you translate your programming ideas into reality, reduce project development times, improve system performance, and deliver business insights based on collected data.



Flexible, Modular Hardware

NI modular hardware, which ranges from high-performance RF instrumentation to low-cost measurement devices, has flexible I/O that helps you to reconfigure hardware in software and avoid buying new equipment every time application needs change.



Seamless Integration

With seamless integration of flexible hardware and productive software from one vendor, you can design measurement and control systems more rapidly. NI software and I/O hardware work together so you can stop sweating the details and focus on designing better systems faster.



Openness and Interoperability

The openness and flexibility of the NI platform allows you to choose to use NI software and hardware or third-party tools in multiple different combinations. You can accelerate your system design to reduce complexity, innovate faster, and continually integrate new technologies based on the tools that you prefer.

Testing from laboratories to manufacturing floors

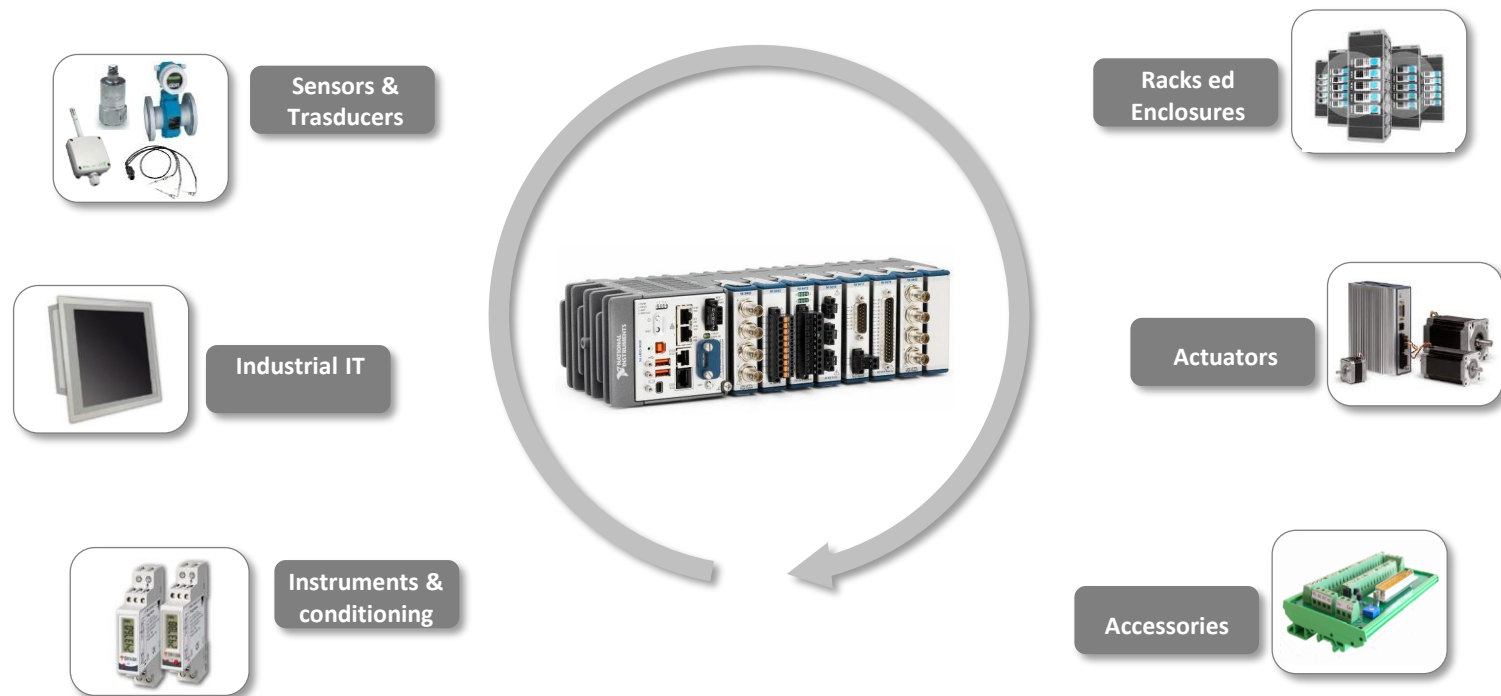
- ✓ Accuracy
- ✓ Ruggedness
- ✓ Computing power



MeasureIT

Sensor expertise

Know your sensors



First NI Channel Partner for sensors



Technical support

- Sensor expertise and support
- National Instruments™ interoperability warranty

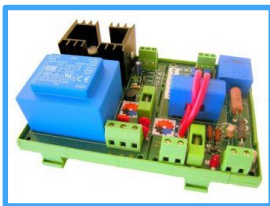
Efficiency

- Website & e-commerce
- Working with NI sales and NI partner ecosystem

Energy efficiency custom board for specific needs

Accuracy 0.5%

Current
Voltage



Accuracy 0.2%

Current
Voltage



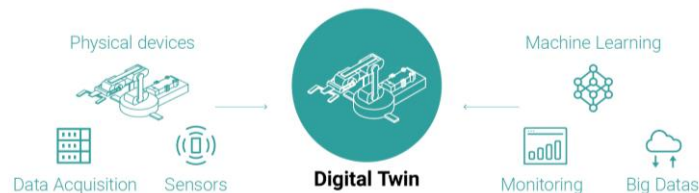
Accuracy

Current 0.01%
Voltage 0.05%



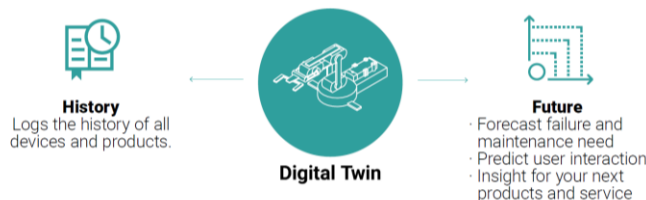
Digital twin for testing

Digital twin: what?



A Digital Twin is a **real-time** digital replica of a physical device

It is a bridge between the physical and digital world.

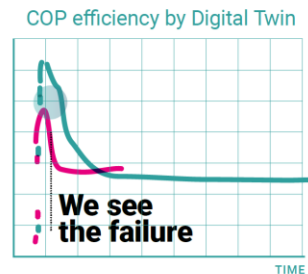
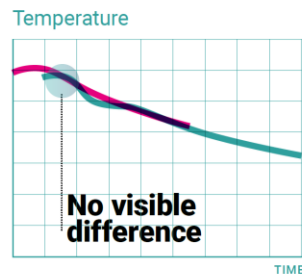


It is more than just a digital replica

Digital twin in testing



Shorter testing time



Better accuracy and quality

Physical end-of-line-testing



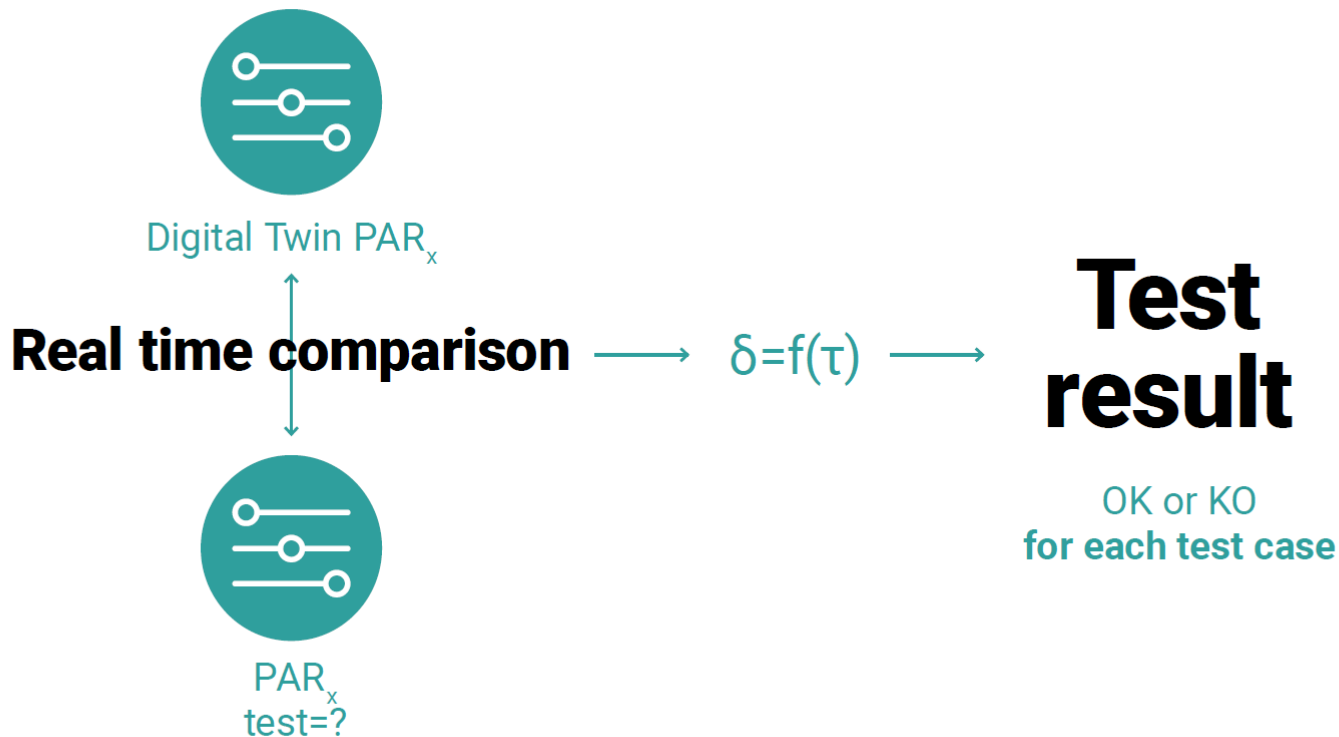
The chiller cannot be fully tested in production end of line

Digital Twin
Virtual end-of-line-testing

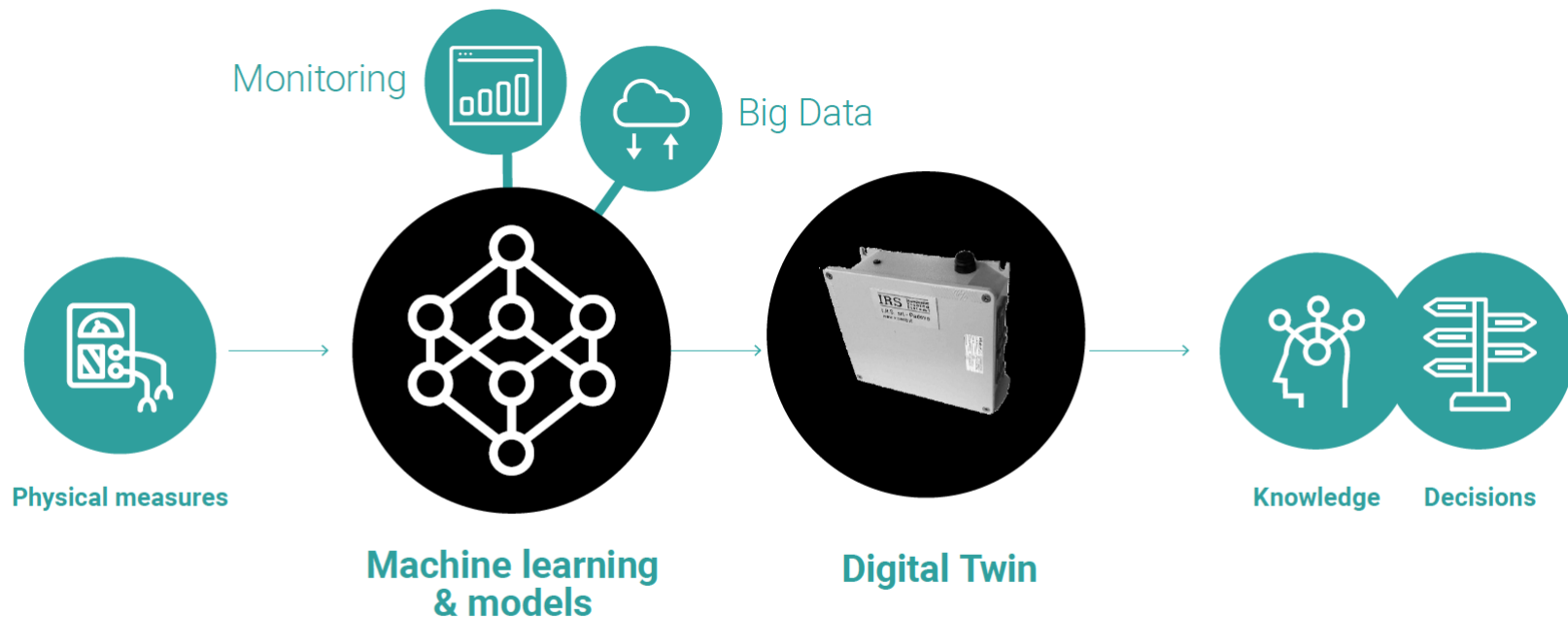


Thanks to the digital twin, virtual conditions are verified

Basic principles



System architecture



I.R.S. implementation



**Real time online
measurement platform**



Machine learning models



TwinMind®

Example home appliances energy label in Europe

Refrigerators



Washing machine





Test systems for fridge testing on 100 % production

- NI CompactRIO testing 4 appliance simultaneously
- Sensor optimization
- Digital twin for shortening testing time



Automated test systems for washing machine on 100 % production

- Fully automated tests based on CompactRIO and NI LabVIEW
- Sensor selection
- Adaptive testing sequence and algorithm

Conclusions

Lower complexity, reduce development time, and add machine learning to energy label testing using the modular NI data acquisition platform



Thank you for your attention.

**any question or inquiry
info@irsweb.it**

I.R.S. video presentation



<https://youtu.be/V6h8VWY-Wpo>

Mission and vision



Our mission and vision

Deliver augmented measurement, test and control solutions. IRS aims to be the company leader in development, manufacturing and delivery of test, measurement and control systems. IRS systems translate into value for customers thanks to technological innovation, advanced modeling and design as well as professional production and after sale services.

Increase customer value generation going beyond traditional solutions. We enable our clients to increase their value generation, going beyond traditional monitoring and control solutions, by providing self-intelligent subsystems for embedded industrial applications at a highly competitive cost of ownership.



Client focus



Innovation



Team work



Efficiency

We are uncovering a better ways of developing solutions and systems. Through our agile organization we have come to get efficiency, flexibility and customer satisfaction. Agile principles we apply are:

Customer first

Value driven iterative system developments

Customers, developers and testers continuous interaction

Continuous attention to technical excellence and good design

4G LTE 12:54 PM

Surveys

Title
Processing at the Edge: Why a Platform-Based Approach Is Ideal for the IIoT

Time
Tuesday, 1:00 PM - 2:00 PM

Speaker(s)
Nick Butler

Nick Butler

*1. Please rate the session content on the following

Overall Quality
- select one -

Technical Level
- select one -

Relevance to your job
- select one -

Relevance to published title and abstract
- select one -

Nick Butler

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