Valmetin HIMA turva-automaatio ja case-esimerkkejä

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TP23051808 by TÜV SÜD

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Co-operation with HIMA

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HIMA company

Competence center for safety technology

- Medium-sized company
- Owner operated since 1908
- Headquarter, Brühl, near Mannheim, Germany
- Revenue. ~140 M€ (2019)
- 800 employees around the world
- 35000 installed systems

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Co-operation with HIMA

Key facts & figures

- Partner agreement
- Sales and product trainings
- Engineering know-how
- Common R&D programs
- Collaboration with HIMA regions
- Product knowledge
  - HIQuad
  - HIMatrix
  - HIMax

- 1994 - First Valmet installation
- 1996 - Partner agreement
- ~250 - number of Safety Systems delivered
- ~25 - number of countries 1) delivered
- > 30 years experience

1) Austria, Belgium, Brazil, China, Croatia, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Italy, Latvia, Netherlands, Norway, Poland, Portugal, Russia, Singapore, Slovakia, South Africa, Spain, Sweden, Thailand, USA

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Product portfolio used by Valmet

- Ideal for mid-size and large applications with the highest requirements on plant uptime, flexibility and reaction time
- Nonstop operation
- Maximum performance
- Maximum configuration flexibility – for life
- **Recommended for applications where redundancy is required**

- HIQuad-X for small and mid-size applications with high fault-tolerance requirements
- Scalable redundancy
- Central & distributed installations
- Broad range of I/O modules
- **Recommended for HIQuad upgrades**

- For decentralized and time-critical applications in which fault tolerance is provided by the process
- Fast, flexible, compact
- Extremely cost-effective solution
- **Recommended for small, mid-size applications where redundancy is not required**

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HIMA HIMatrix series

- Compact and modular safety-related controllers and remote I/O modules
- Proven HIMA safety technology
- SIL3 certified
- Response time ≤ 20 ms, cycle time for 1 K program approx. 0.02 ms
- Communication via **safeethernet** or Modbus/TCP
- Engineering:SILworX – the safety application manager

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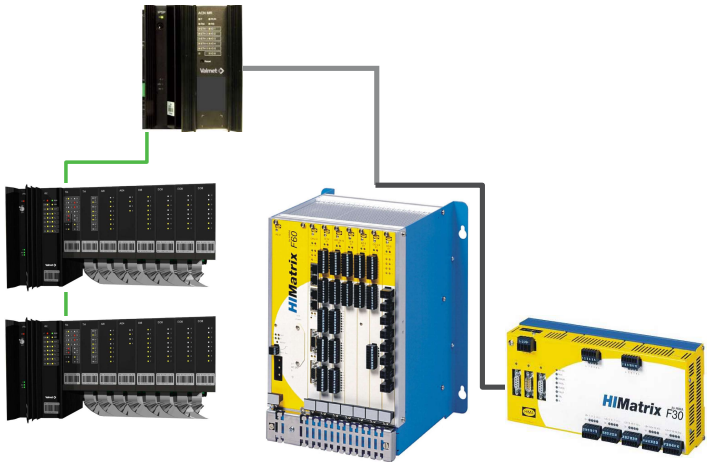
Valmet DNA HIMatrix system integration

- Fast, Ethernet interface using “HIMA safeethernet” protocol
- The protocol allows access to all data areas of HIMatrix using HIMA tag names
- Fast communication cycle
  Time stamping in ACN
- Engineering: SILworX

ACN RT G4- /ACN CS
G2 or ACN MR
process controller



HIMatrix SIS system
- Redundancy not supported

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HIMA HIMax series

- Flexible mechanical design
- Fully enclosed modules
  - EMC protection
  - Mechanical protection
- SIL3 certified
- Nonstop operation
  - Replace module without disturbing I/O or power wiring
- High performance
- Distributed safety applications
- Conformal coating
- Engineering: SILworX – the safety application manager

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Valmet DNA HIMax system integration

- Fast, optionally redundant Ethernet interface using “HIMA safeethernet” protocol
- The protocol allows access to all data areas of HIMax using HIMA tag names
- Fast communication cycle
  Time stamping in HIMax
- Engineering: SILworX

Single or redundant
ACN RT G4- /ACN CS G2 or
ACN MR process controller

Single or
redundant HIMax
SIS system

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HIMA HIQuad X series

- **An upgraded HIQuad**
- Two systems:H51X and H41X
  - New CPU with more processing power
  - New power supplies
  - New communication modules
- **IO modules are the same as with HIQuad**
- SIL3 certified
- Both families use the same range of I/O modules
- Fast, optionally redundant Ethernet interface: Modbus/TCP protocol and safeethernet
- Engineering: SILworX

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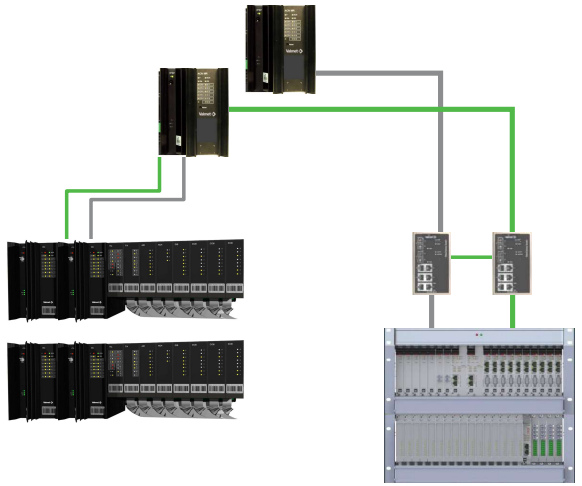
Valmet DNA HIMA HiQuad X system integration

- Fast, redundant Ethernet interface using Modbus/TCP protocol
- The protocol allows access to all data areas of HIMA
- Fast communication cycle
  ~ 200 ms Time stamping in ACN
- Valmet DNA interface configuration using FbCAD symbols
- Engineering SILworX

Single or redundant ACN process controller



Single or redundant HiQuad X SIS system

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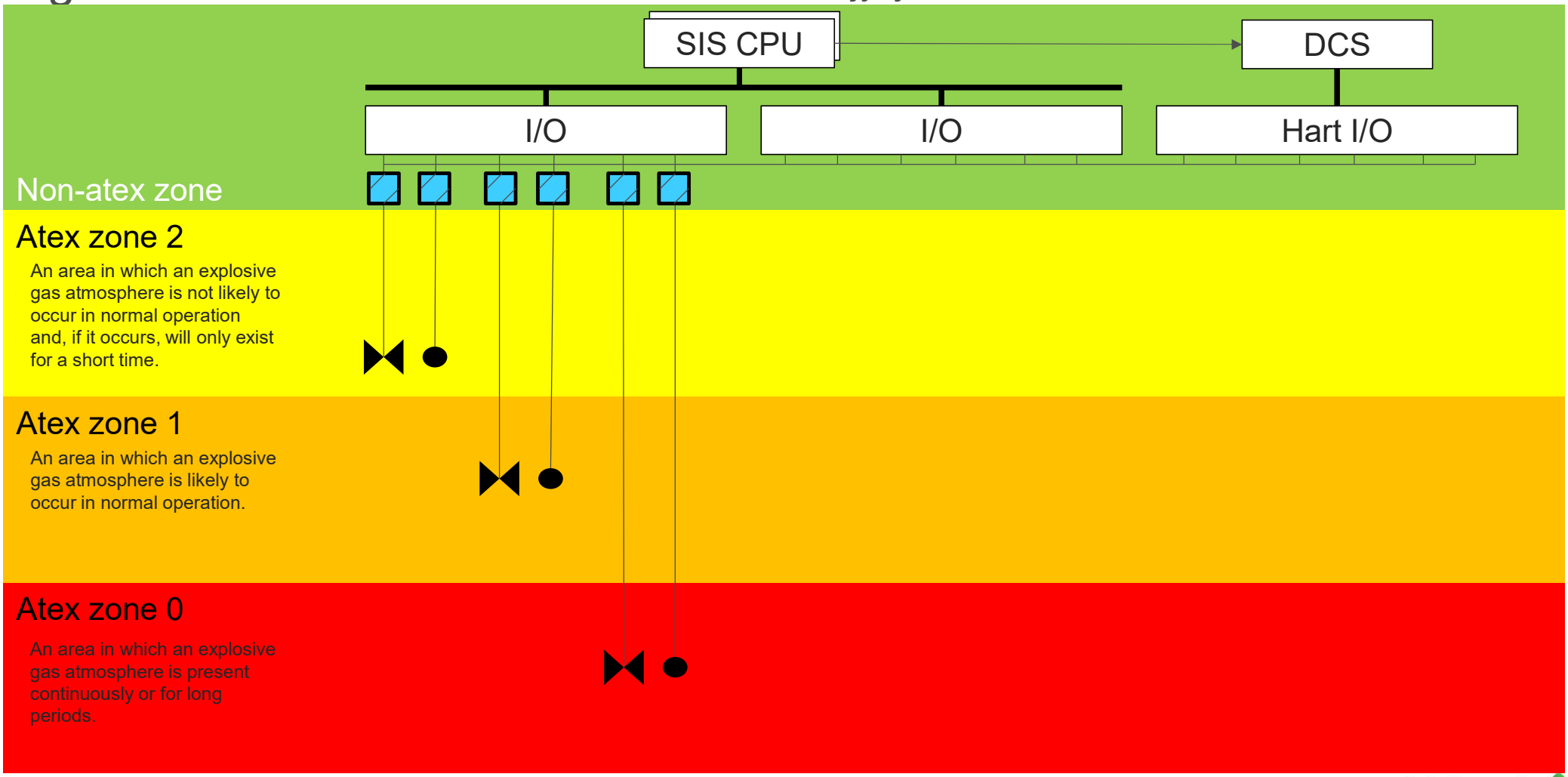
Signaalitie

Case: Öljynjalostamon turva-automaatio ValmetDNA



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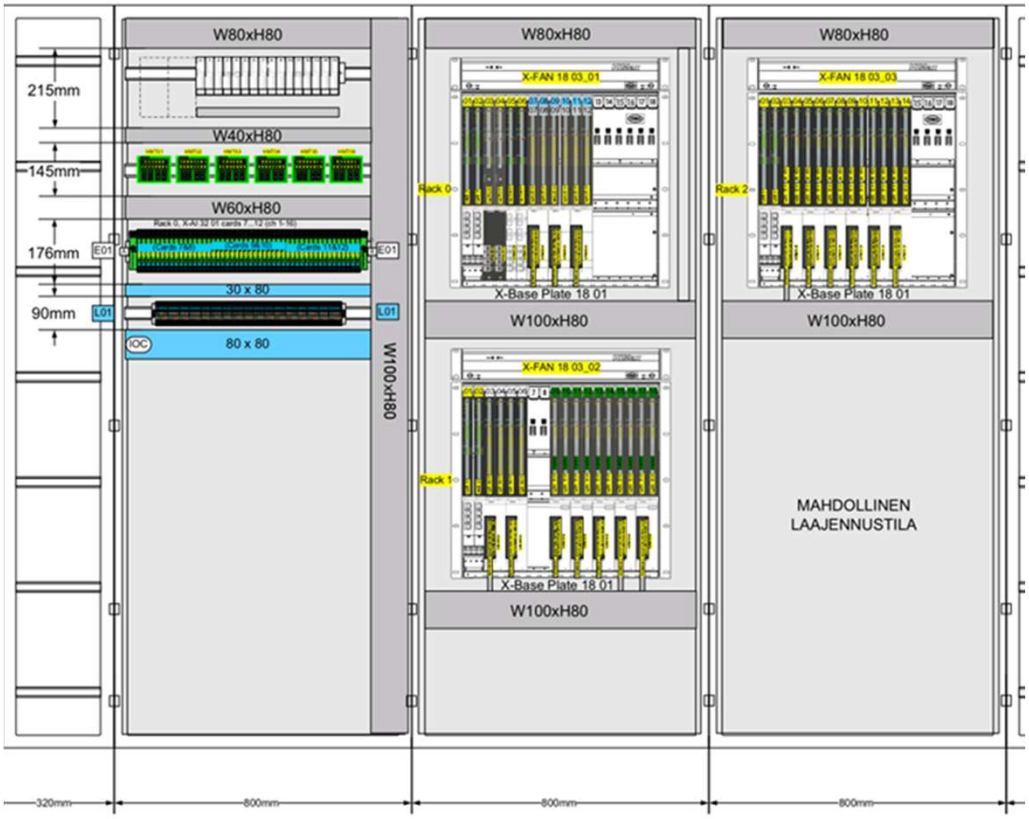
ValmetDNA turva-automation toteutus

Case: Öljynjalostamon turva-automaatio ValmetDNA



Turva-automation osat

- Kahdennetut HIMAX keskusyksiköt (CPU)
- Kahdennetut HIMAX tulo- ja lähtökortit (I/O)
- EX i ja galvaaniset erottimet
- Kahdennettu liikennöinti ValmetDNA DCS kanssa Safeethernet kommunikoinnilla
- SILworX Konfigurointipääte ja –ohjelmisto
- Ym. vaaditut varustelut

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Esimerkki 2oo3 suojaus (SIL2)

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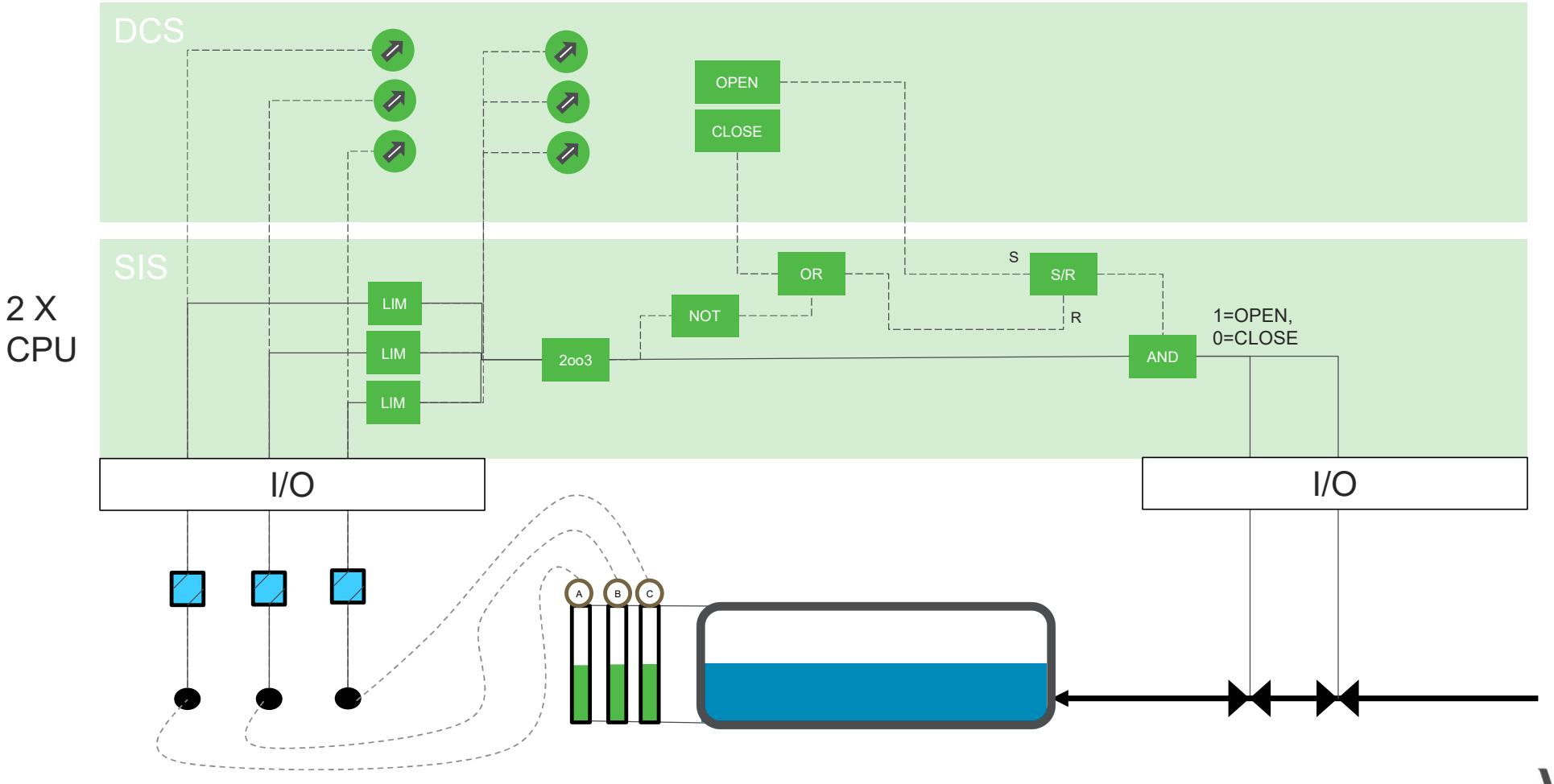

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Valmet Automation toimituksen laadunvarmistus

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Laitteiston laadunvarmistus

Sovelluksen laadunvarmistus

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Projektin aikaiset tarkastukset

Case: Öljynjalostamon turva-automaatio ValmetDNA

Asiakkaan tarkastukset

- FAT, Factory Acceptance Test
  - Kaikki turvatoiminnot koestetaan yksitellen periaatteella I/O->I/O
  - Diagnostiikkatoimintojen koestus
  - Kahdennuksen koestus
  - Havaitut putteet korjataan
  - Dokumentoidaan koestuksien tulos
- SAT, Site Acceptance Test
  - Tarkastetaan asennus käyttökohteessa
  - Koestetaan diagnostiikkatoiminnot
- Piirikoestukset
  - Kaikki signaalitiet koestetaan kenttälaitteelta (turva-automation kautta) käyttöautomaation ruudulle
- 1. Turva-automation määräaikaiskoestus/inegrointitestit ennen käynnistystä/käynnistyksen yhteydessä

Tarkastuslaitos

- Turva-automaation suunnittelu- ja toteutusprosessin arviointi IEC 61508 ja IEC 61511 mukaisesti.
- Toiminnallisen turvallisuuden arviointi


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