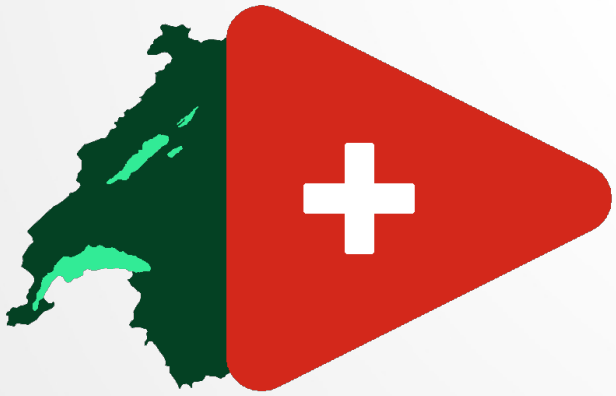
Sci-Consulting

présente

NI-Motion – legacy devices, how to in LV 2024 ?



Vincent Berseth, Adrien Allain

Romandie LabVIEW User Group Meeting
16 juin 2025

Who are we ?

Sci-Consulting

Partner
SYSTEM INTEGRATION

Training Partner

Services et solutions de développements sur mesure depuis 34 ans

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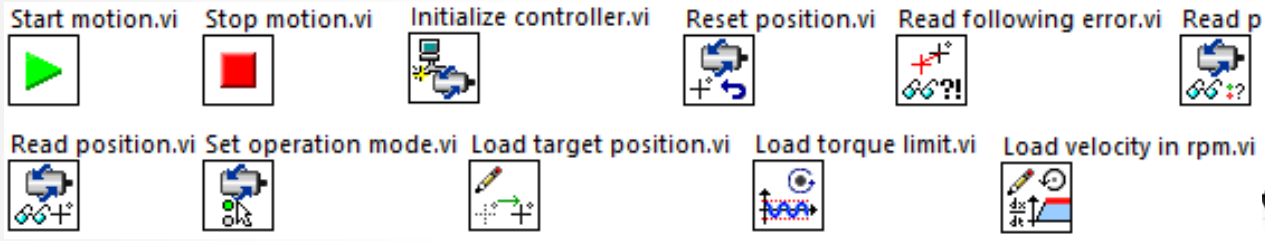
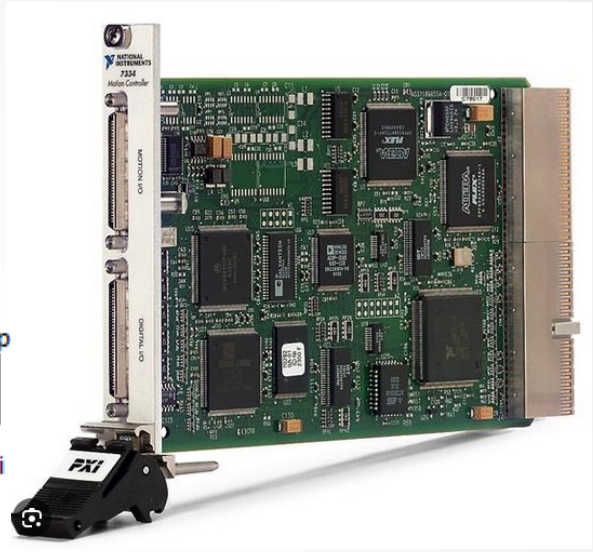
Legacy NI Motion devices, PCI and PXI

- NI 734x and NI 735x family 2, 4 or 8 axis
- Axis tuning and configuration in NI-MAX
- Clear and easy to use palette, «NI style»

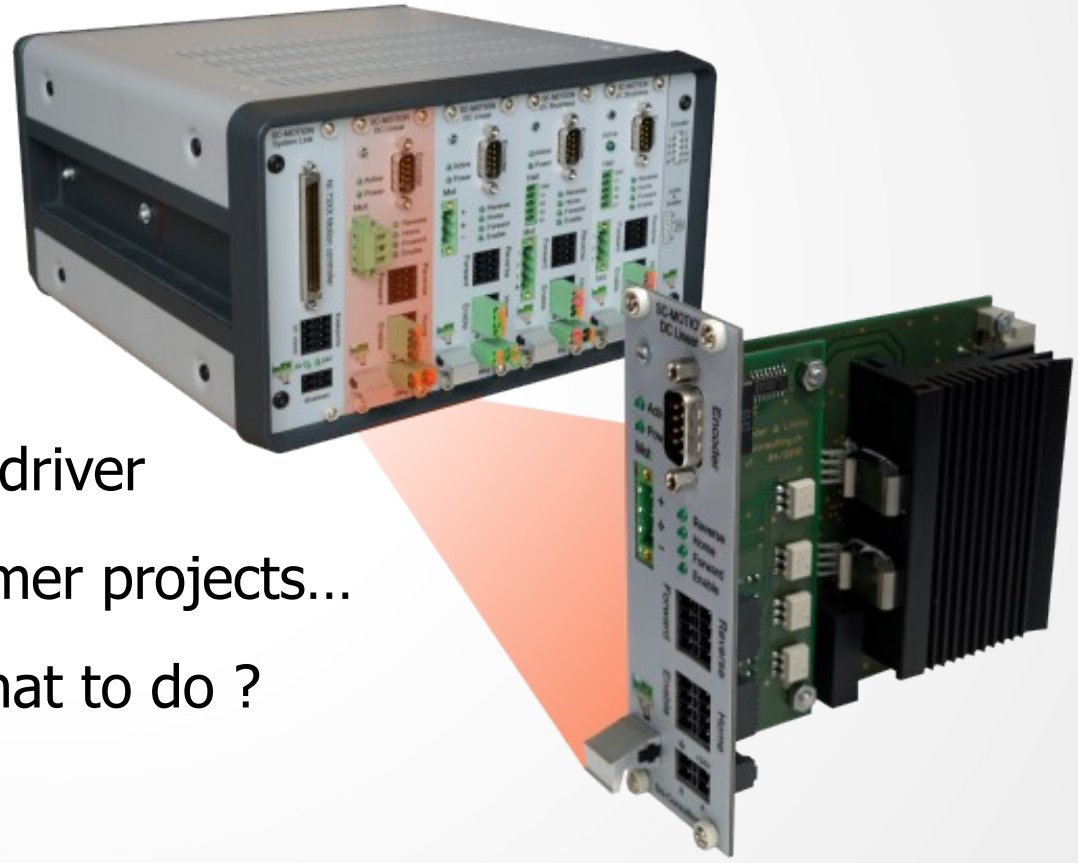




- High performance motion control (gearing, blending, etc.)
- Stepper, brushed and brushless motors
- 68 pins connectors, only low power / low voltage signals
- Needed a power stage for the motor, analog control (±10V)
- Driver last supported on LabVIEW 2017

SC-Motion interface

- 1 Chassis per 68 pin connector, i.e. 4 axes, optionally rackable
- 1 slot per axis, with power stage for motor, isolated line receivers for encoders, isolated level converters (24V – 5V) for limit switches etc.
- Variants for Stepper, Bushed DC and Brushless motors, providing per axis full modularity
- Industrial connectivity, status LEDs
- Current (torque) read-back, readable with regular NI-Motion driver



Many have been deployed for customer projects…

But NI-Motion dropped in 2018 – what to do ?

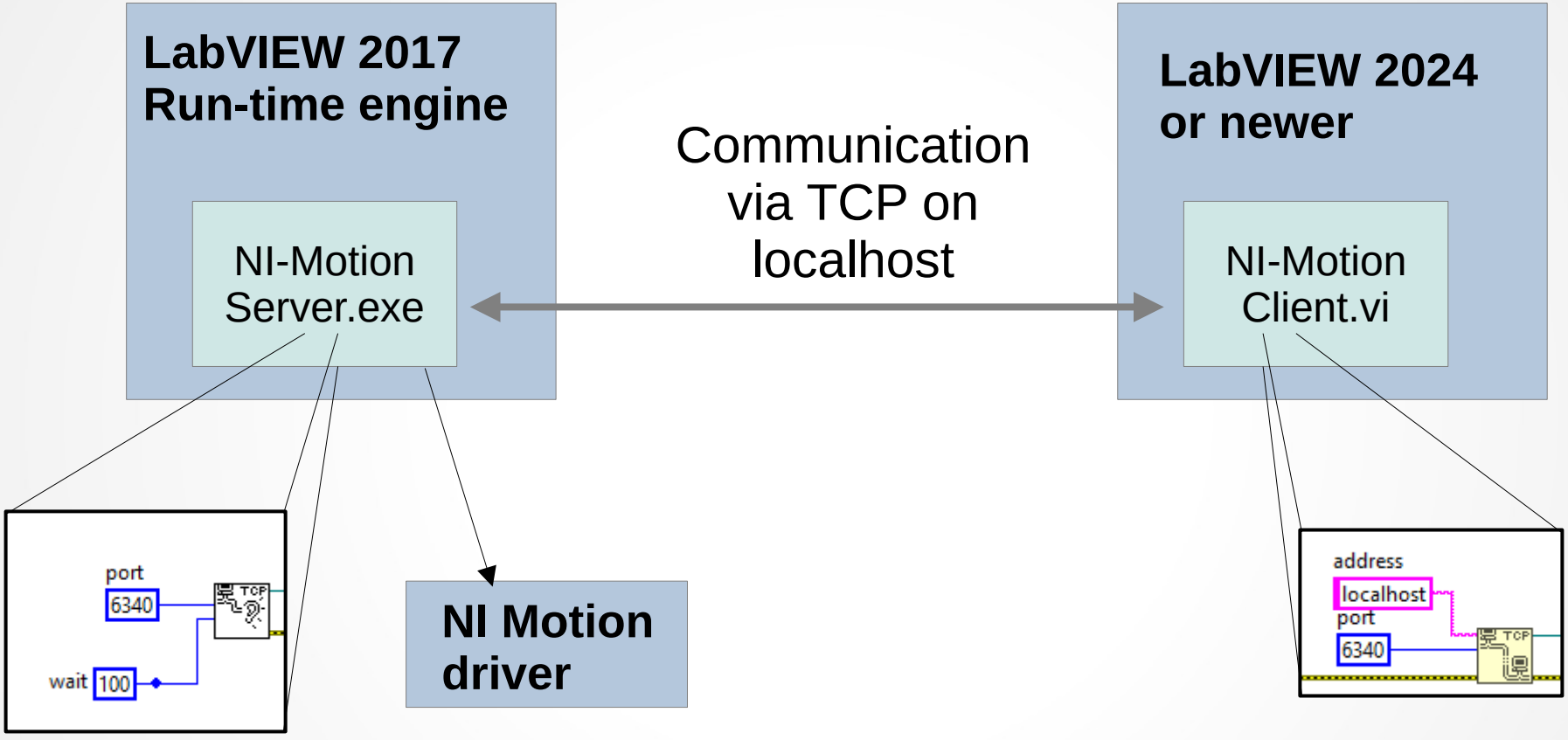
Preserve Hardware & most of SW

- Hardware in itself has some cost
- The biggest issue though is cabling: dropping NI-Motion + SC-Motion combos and replacing with third party drives would imply replacing racked devices (PXI, SC-Motion interface) with DIN rail components, re-cabling everything, etc.
- The software control would have to be entirely re-written from scratch

Idea : the wrapper approach

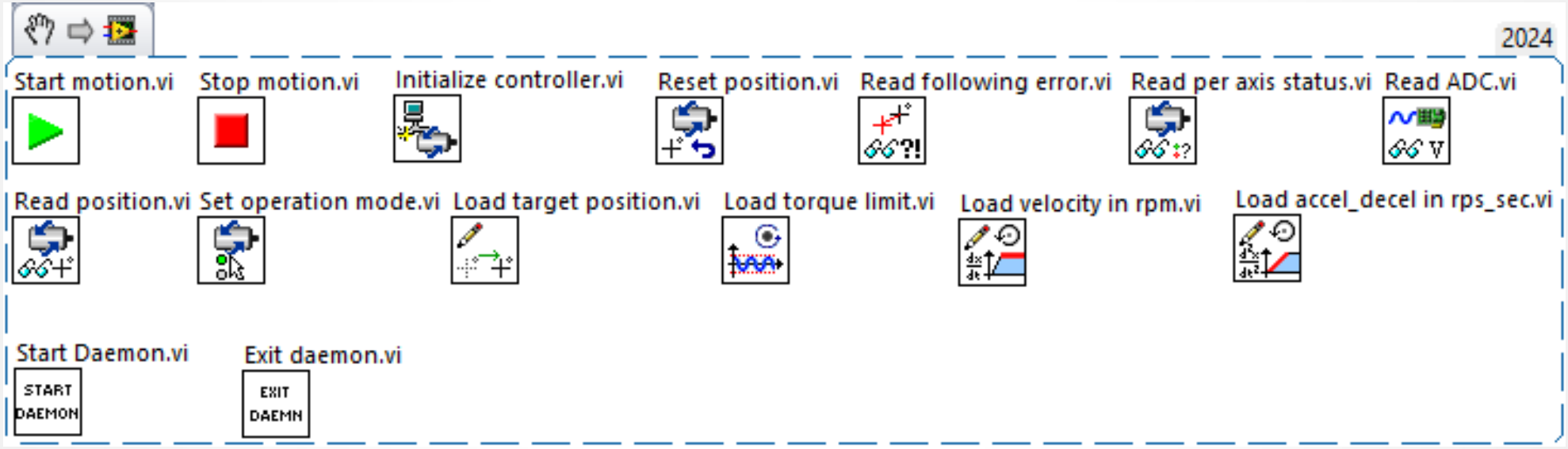
- Keep using Legacy NI-Motion devices
- Control them with LabVIEW 2017 Run Time (Exe)
- Create API for newer versions of LabVIEW to talk to LV 2017 Run Time
- By keeping API similar to NI-Motion VI's, no need to change code structure, migration to LV 24 (or later) is easily done

Wrapper architecture

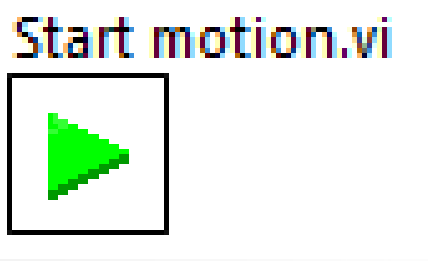


Wrapper architecture

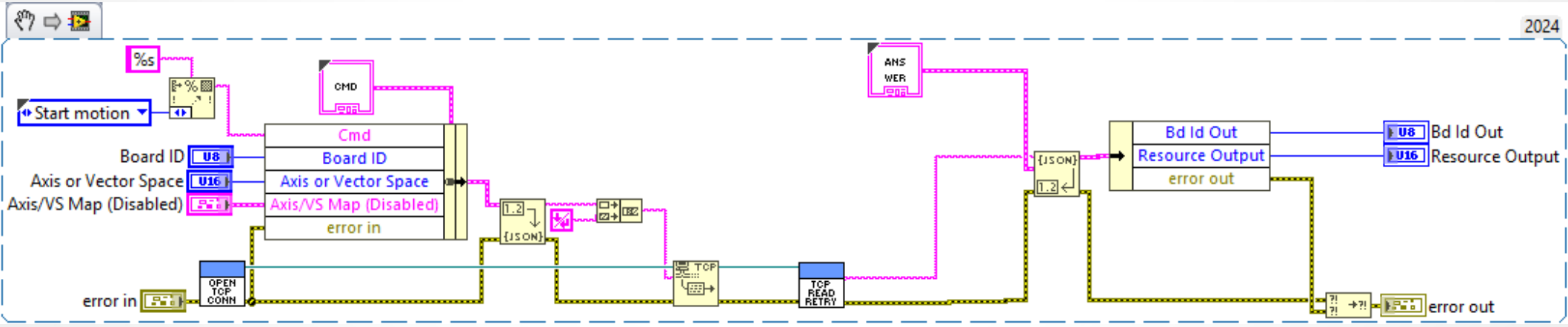
Client library is a 1-to-1 replacement for NI-Motion API with identical connector panes allowing quick update via QuickDrop + Ctrl+P (replace)



Wrapper API

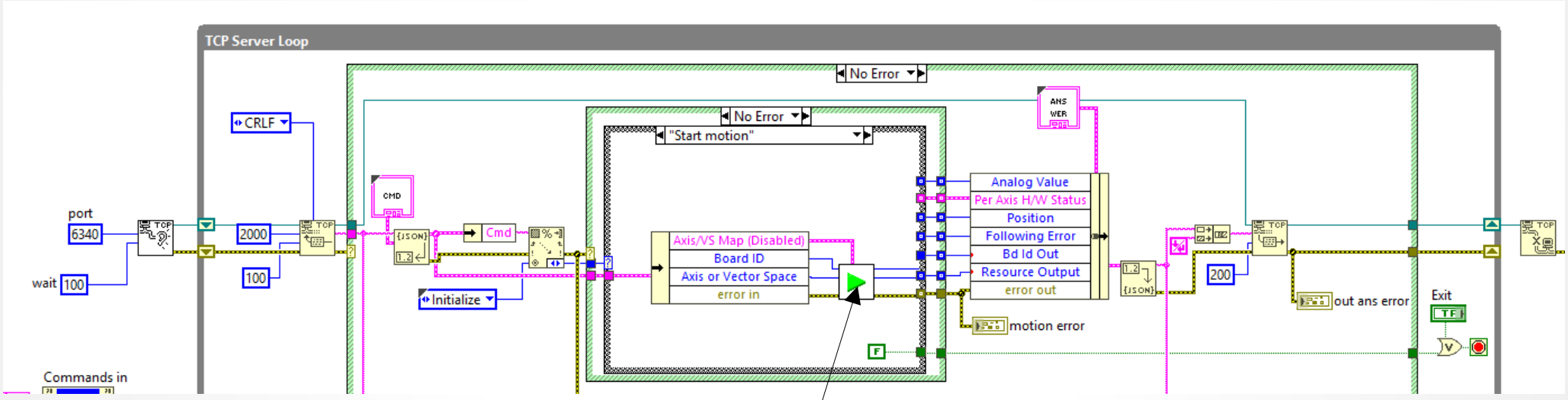


Under the hood the different VI's forward the commands to the NI-Motion server via TCP



Wrapper daemon / server

NI-Motion server.exe receives the commands,
executes the corresponding original NI-Motion API VI
and forwards any answer or error via the same TCP channel

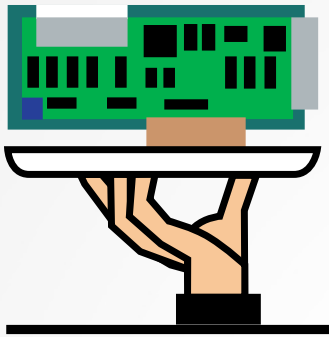


Original NI-Motion API VI
(only available up to LabVIEW 2017)

Limits of this approach

- PXI-734x devices on PXIe chassis ??
  We have solved this issue ! 

- But this approach will only work as long as NI Motion Legacy driver (2017) can be installed on newer Windows, and LabVIEW Run Time 2017 can run on newer Windows
- so far no issues with that 



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Merci de votre attention !

Des questions ?

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