Interface Independent Serial Communication

P. Kankiya, J. Jamilkowski, L. T. Hoff
Brookhaven National Laboratory , Upton, New York,USA, 11973

CONTROLS
Collider - Accelerator Department

INTRODUCTION

A common problem faced when providing equipment control infrastructure for different accelerator systems is the variety in communication interfaces used by the competing manufacturers

The diversity in physical interfaces makes the software development process for controlling devices somewhat non-uniform.

PROPOSED SOLUTION

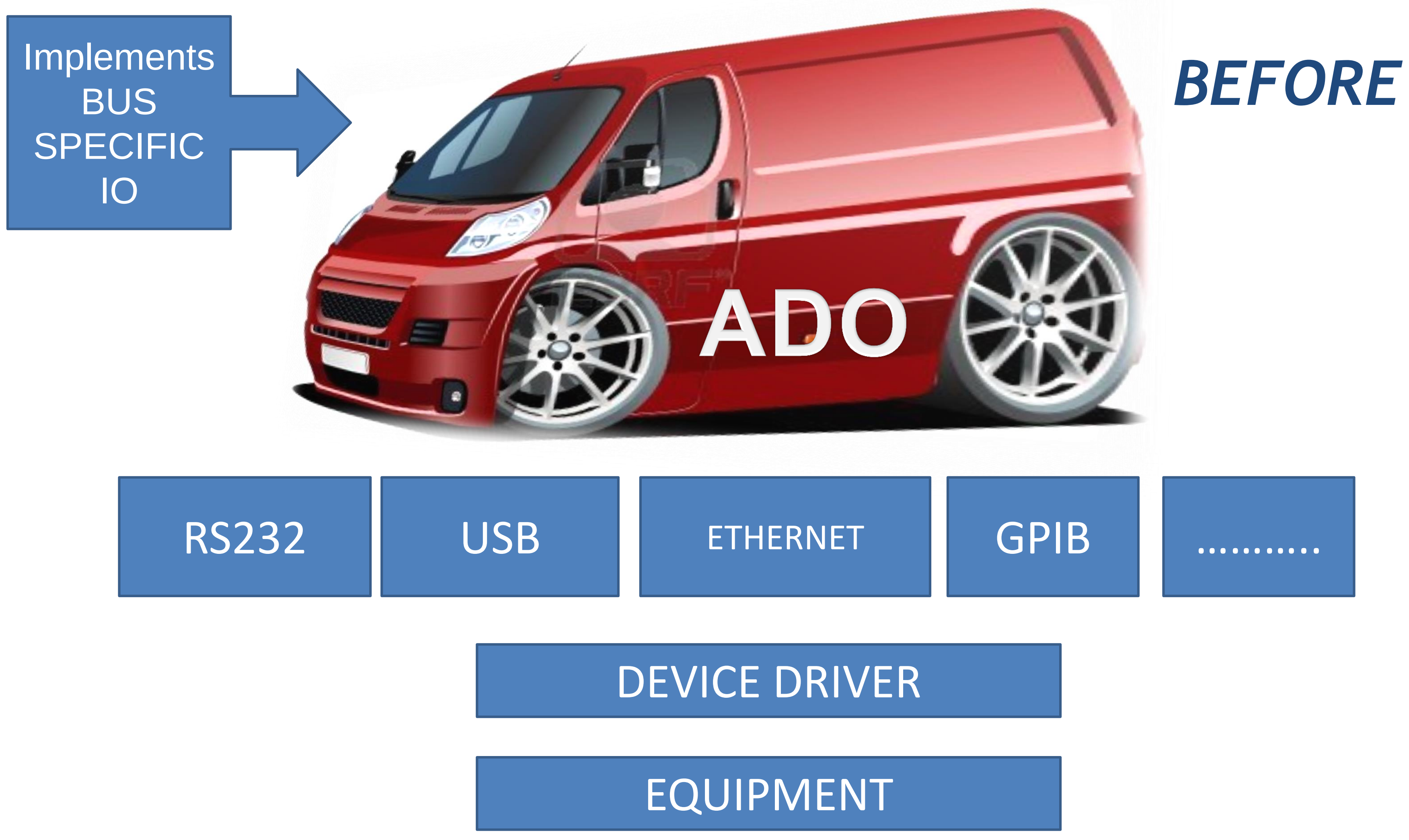
A Software Abstraction Layer "IISC":
A one stop solution to initiate, communicate and terminate connection with multiple forms of hardware interfaces

Enforces layered architecture and object oriented programming model.

Easily portable across other control frameworks.

Restricts access to all resources by default, allowing access only through well-defined entry points

INTEGRATION



Implements BUS SPECIFIC IO

BEFORE

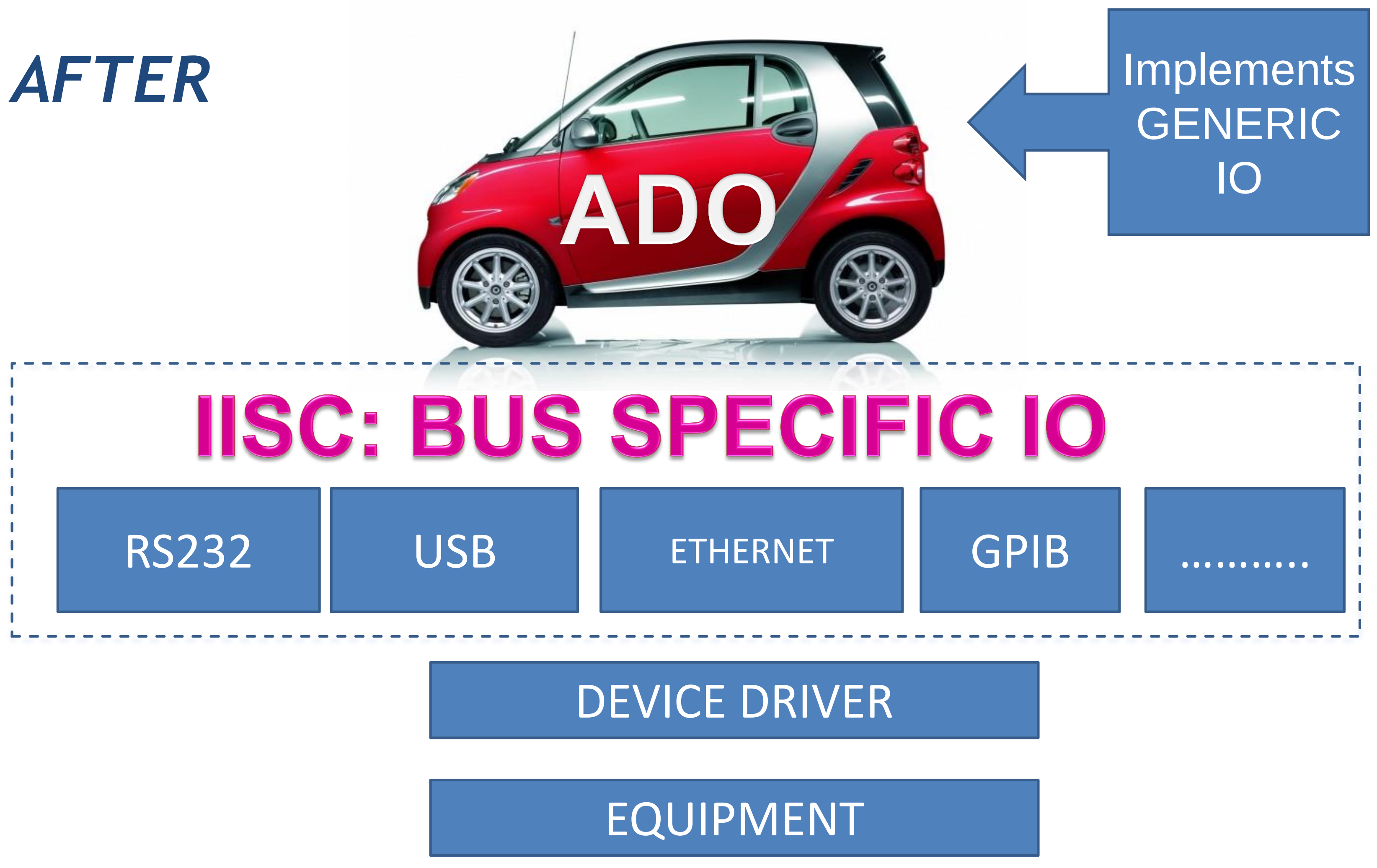
ADO

RS232 | USB | ETHERNET | GPIB | ....

DEVICE DRIVER

EQUIPMENT

The code for establishing communication with a device in primitive case resides inside the ADO class leading to code bloat and duplication.



AFTER

Implements GENERIC IO

ADO

IISC: BUS SPECIFIC IO

RS232 | USB | ETHERNET | GPIB | ....

DEVICE DRIVER

EQUIPMENT

Houses only general operations leading to reduction in code size and enforced standardization.

TEST CASE

STATUS AND PLANS

- IISCDev library class hierarchy has been laid out, using C++ "factory" design pattern.
- A set of standard IO functionality implemented as wrapper functions on top of IEEE488(GPIB) support library has been tested.
- The sub class also provides routines for error checking and re-connection mechanism in case of failure or loss of communication.
- Future versions of the library are expected to include callback routines to get asynchronous updates of device parameters.
- IISC can be extended to support more types of hardware interfaces and devices. Eg. Vxi 11 or bridging devices.

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