

Bloomy EFT Module for TestStand



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The Leader in Automated Test, Data Acquisition, and Control Systems



#OurGiantsAreFemale – Lidia Grzebieta

Lidia Grzebieta was born in Poland in 1955.

- She studied Civil Engineering in Krakow at Polytechnic Krakowska named Tadeusz Kosciuszko specialising in structures. She undertakes postgraduate study to receive Master Degree - BE (civil) MEngSci.
- Employed as structures engineer
- Her Roles included
 - Lidia has extensive experience in concrete design and some in steel design focusing mostly on pre-tension and post-tension bridges and industrial structures.
 - She carried out and participated in bridge inspections, assessment and rehabilitation.
 - Her experience includes construction supervision on bridge projects including working with and advising contractors.
- Her Project Included
 - 1-billion-dollar project involving the design of 11 prestress concrete bridges and a tube tunnel. Responsible for design of substructure for 5 bridges including seismic requirements and buckling analysis. Design of a superstructure post-tension box girder for 2 bridges consisting of six, forty metre long spans.
 - For 4 years she was part of team working on the City Link Project from preliminary design, detail design and construction stages. Her most famous structure but not the most complicated in design is 300 m long Acoustic Tunnel on the elevated structure pass Bolte Bridge.
 - From 2009 to 2015 she worked for Transport New South Wales in New Bridge Design. She designed new Bridges road and pedestrian and undertook review and proof check of other designs.



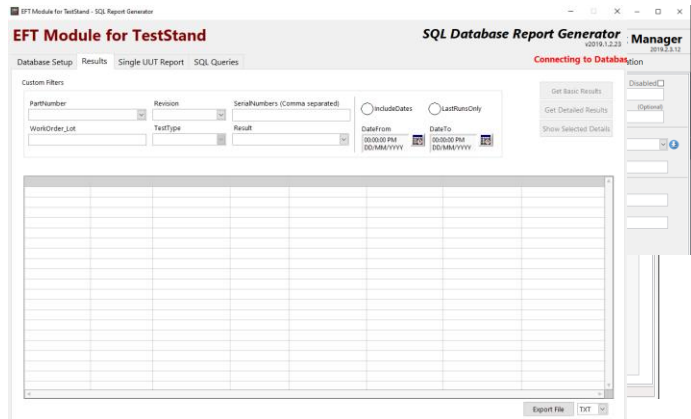
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- Studied Civil Engineering in Krakow at Polytechnic Krakowska
- extensive experience in concrete design and some in steel design and post-tension bridges and industrial structures
- Acoustic Tunnel on the City Link Project in Melbourne

Bloomy EFT Module

- Manufacturing Operator Interface
- Hardware Access Framework (HAF)
- SQL Database Reporting



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- Out of box software package developed by Bloomy
 - Manufacturing Operator Interface
 - Hardware Access Framework (HAF)
 - SQL Database Reporting But will not be discussing this as we use system link for reporting

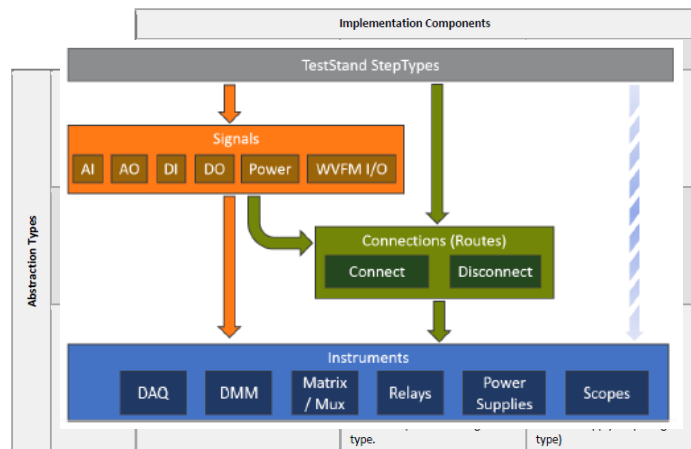
Hardware Access Framework Manager (HAF)

Implementation Components

- Channel Configuration File
- Bloomy TestStand Step Types
- Plugin Drivers

Abstraction Types

- Instruments
- Signals
- Connection



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- The HAF provides an intuitive interface for developing test sequences using configuration dialogs rather than direct code calls. This reduces the need for intimate hardware, driver software, and connection knowledge.
- In addition, it allows test steps to be developed from the point of view of the unit under test (UUT) using signal types (like analog input/output, waveform input/output, digital input/output, power output/readback, and communications messages) rather than the specific instrumentation (like DMM,

DAQ, Power Supply).

- The three implementation components that a developer interfaces with are: the **Channel Configuration File**, and the **TestStand Step Types**, and **Plugin Drivers**. Typically
- The configuration file maps this alias to real-world instrumentation parameters.
- HAF Step Types only interface with Connections and Signals.
- The HAF is an abstraction framework for TestStand that links instrument, switching, and signal configuration information to human-readable aliases using a Configuration File.
- **Instruments:** Defines physical address and initialization parameters of instrumentation defined by instrument aliases for a specific test sequence
- **Connections:** Defines switch routes for a specific test sequence. Each row contains a single connection alias that can reference multiple channels across multiple devices.
- **Signals:** Defines the various signals (AIO, DIO, Power, etc) for a specific test sequence. Each row contains a single signal alias and definition

- shows the interaction between the HAF TestStand Step Types and the Instrument, Connection, and Signal abstraction areas.
- The benefit of this configuration is that it allows hardware changes to be made (like changing an instrument out with a different make/model), without requiring any changes to a test sequence

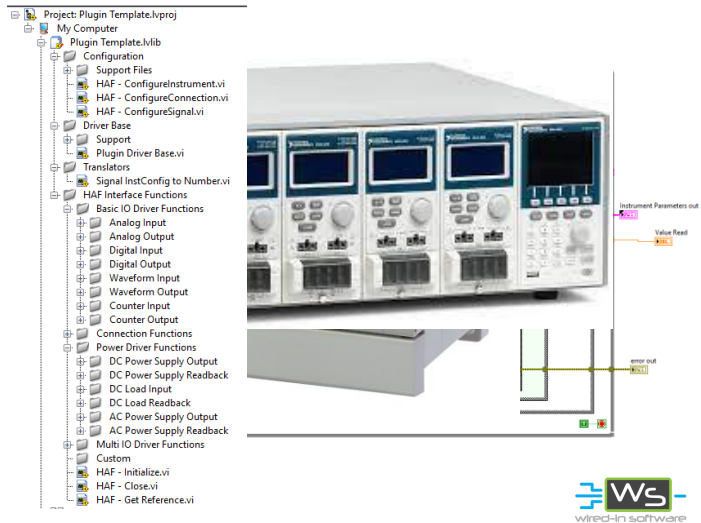
Custom Instrument Driver

Plugin Driver

- Comms Plugin Template
- Instrument Plugin Template

Example Drivers

- Modbus for PLC Communicatic
- NI E-load



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- Typically, most developers do not need to directly interact with the plugin drivers. When developing test sequences, only the configuration file and step types are required. New plugin drivers only need to be developed when the existing drivers do not support a particular instrument.

Bloomy offer two plugin drivers Template

- Comms Plugin Template
- Instrument Plugin Template
- Base driver example code
- We have created
 - Modbus plc communications
 - E-load

Comms Devices and Comms Messages

Types of Devices

- NI XNET CAN – Signal
- NI VISA
 - RS-232,
 - RS-422/485
 - GPIB

Comms Messages

- Commands for devices

The screenshot shows the HAF Manager software interface. The 'Comms Messages' tab is active, displaying a table with the following columns: Index, Name, Group, Device, Write Definition, Status Expression, Write Settings, Read Settings, Write-Read Delay, and Notes. The table contains one row with the value '1' in the Index column and '0' in the Write-Read Delay column. The rest of the table is empty.

Index	Name	Group	Device	Write Definition	Status Expression	Write Settings	Read Settings	Write-Read Delay	Notes
1								0	

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Comms Devices

- Devices that can be set up include NI XNET CAN – Signal, NI VISA
 - RS-232,
 - RS-422/485
 - GPIV
- Any Instalment with a communication protocol can be set up
 - Barcode reader
 - Even custom PCBA firmware for factuality testing

Comms Messages

- Firmware commands
- Instrument Commands
- Barcode reader commands

Bloomy HAF Demo

NI PXI Simulation

- NI Switch -> PXI-2530 -> MTX -> MATRIX4X32
- NI DAQ -> PXI-6221 -> DAQ -> DAQ6221
- NI DMM -> PXI-4065 -> DMM -> DMM4065
- NI DAQ -> PXI-6515 -> IND_DIO
- NI DC Power -> PXI-4110 -> UUT_PS -> PXI_

Barcode scanner (not simulated)



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- The Demo is Based on the Batch example provide by bloomy
 - Simulated equipment
 - Barcode scanner
- Add instrument
- Add Connection
- Add Signal
- Add Comms device barcode scanner
- Add Comms message
- Demonstrate barcode scan

TestStand Demo

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- TestStand Demo
- Show step types
 - Initialize devices and HAF
 - **Place:** Connection, Analog Input, Analog Input (NLT), DC power, DC Power Supply Output
 - Two types one with limit checking and one without
 - **Edit** sub-steps Panels
 - Show alias
 - Can be defend by expression for parallel or batch process model
 - Show how to imbed images and messages into OI
- Run TestStand Demo
- Int HAF
- Signal simulation
- Close HAF

Real Project Life HAF Example

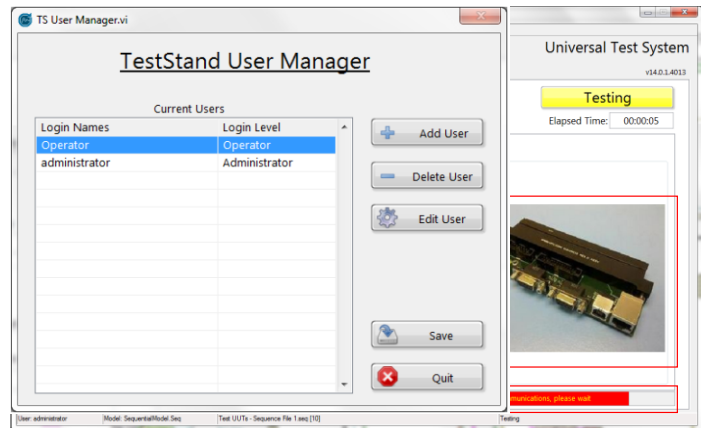
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- Show Instrument setup parallel model
- Show connection linking with signals
- Show customer firmware commands

Manufacturing Operator Interface

- Load test sequences based on UUT part number
- Map part numbers to sequences and fixtures
- Electronic test Fixture ID detection
- Execute and debug TestStand sequences
- Display messages and images to operator
- Integrated user management



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Unit Under Test panel

- The user can select one of the available part numbers from the dropdown menu or manually type the desired part number.

Test Sequence panel

- If there's only one sequence file compatible with the selected UUT, this section will fill autofill

Required ITA / Fixture panel

- If there's only one ITA / fixture compatible with the selected sequence file or if there's a compatible ITA / fixture already connected to the system, this section will fill automatically with

the ITA's ID and the assigned ITA / fixture's image.

- When Starting the test if none of the compatible fixtures are connected or if there's a fixture connected without it being required, the dialog shown in Figure 6 will be displayed.

Debug Execution

- When executing in debug mode, you may Step Over, Step Into, and Step Out of subsequences and code modules using these additional function buttons. Note that these buttons are only available when the execution is paused. Execution when in debug mode will also show additional test details, including variable values (updated in real-time) and the thread/call-stack views.

Displaying images and messages on the OI

Managing Users

- All users are managed through the TestStand engine, and are not linked to Windows.
- Provides a nice GUI to do this within the OI
- Only users with administrator privileges may manage users.

Live demo Manufacturing Operator Interface

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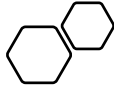


Licences Required

- Licences Deployment Required
 - Bloomy deployment software
 - Labview 2019 Runtime
 - Testsand 2019 Runtime
- There will be a new release which will upgrade the current version to LabVIEW 2022

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About Wired-in Software

- Established in 2013
- 10 employees. 2-4 sub-contractors. Professional and certified engineers and scientists
- Two business units:
 - **LabVIEW Consultancy**
 - **Turnkey Test Systems**
- NI Alliance Partner System Integrator, LabVIEW Champion, DQMH Trusted Advisor, Bloomy EFT Module Reseller
- Customers Australia wide (and New Zealand)

