

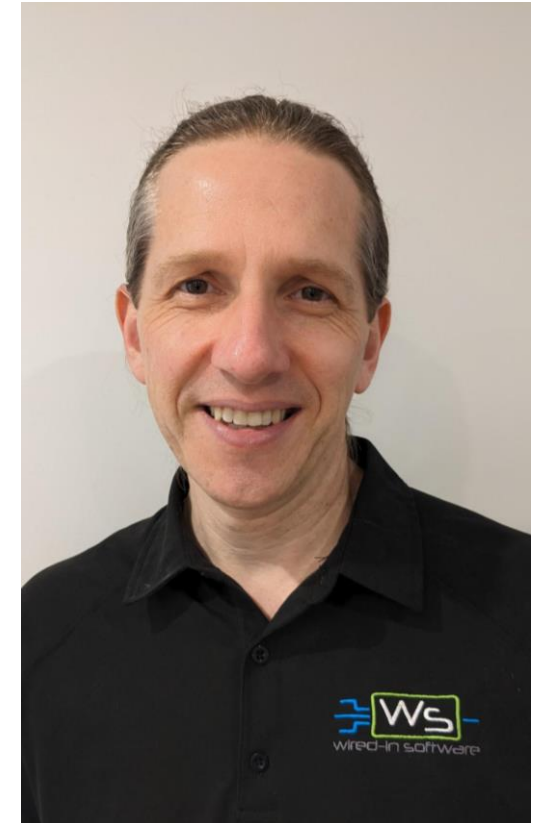
# #OurGiantsAreFemale – Sudha Murty

- An Indian **engineer, educator, author and philanthropist** who is chairperson of the [Infosys Foundation](#)
- Breaking the Stereotype, became **first female engineer** hired at India's largest auto manufacturer TATA Engineering and Locomotive Company (TELCO).
- 2006: **awarded with the Padma Shri**, the fourth highest civilian award in India, for social work by the Government of India
- 2023: **awarded with the Padma Bhushan**, the third highest civilian award in India for social work by Government of India
- **Founded several orphanages**, participated in rural development efforts, supported the movement to provide all Karnataka government schools with computer and library facilities.
- [https://en.wikipedia.org/wiki/Sudha\\_Murty](https://en.wikipedia.org/wiki/Sudha_Murty)



# The Presenters

- **Ashwini A Pandit**
  - LabVIEW Software Developer at Wired-in Software
  - Creator of the WiS Code Quality Check Tool
- **Christopher Farmer**
  - Founder of Wired-in Software,
  - President at GDevCon ANZ Inc,
  - LabVIEW Champion





# WiS Automated Code Quality Check Tool

Ashwini Pandit and Chris Farmer

Wired-in Software Pty Ltd

GDevCon ANZ 2023 – 24 Oct 2023

<http://wiredinsoftware.com.au>

G DEV  
CON

ANZ



# Code Quality Check Tools

1. VI Analyzer
2. Bookmark Manager
3. Antidoc
4. Nattify
5. DQMH Validation
6. VI Description Documenter
7. Code Review Pre Checklist
8. Unit Tests



# 1 - VI Analyzer

- Static VI analysis tool with LabVIEW Professional – catches any silly mistakes
- More than 100 included tests for code analysis
- Helps you improve your code by detecting where code does not match your style
- VI Analyzer enthusiasts community who share their custom tests with everyone
- Download:
  - NIPM or
  - Link:  
<https://www.ni.com/en/support/download/software-products/download.labview-vi-analyzer-toolkit.html#411412>

VI Analyzer Results Window

Test Results | Testing Errors | Summary

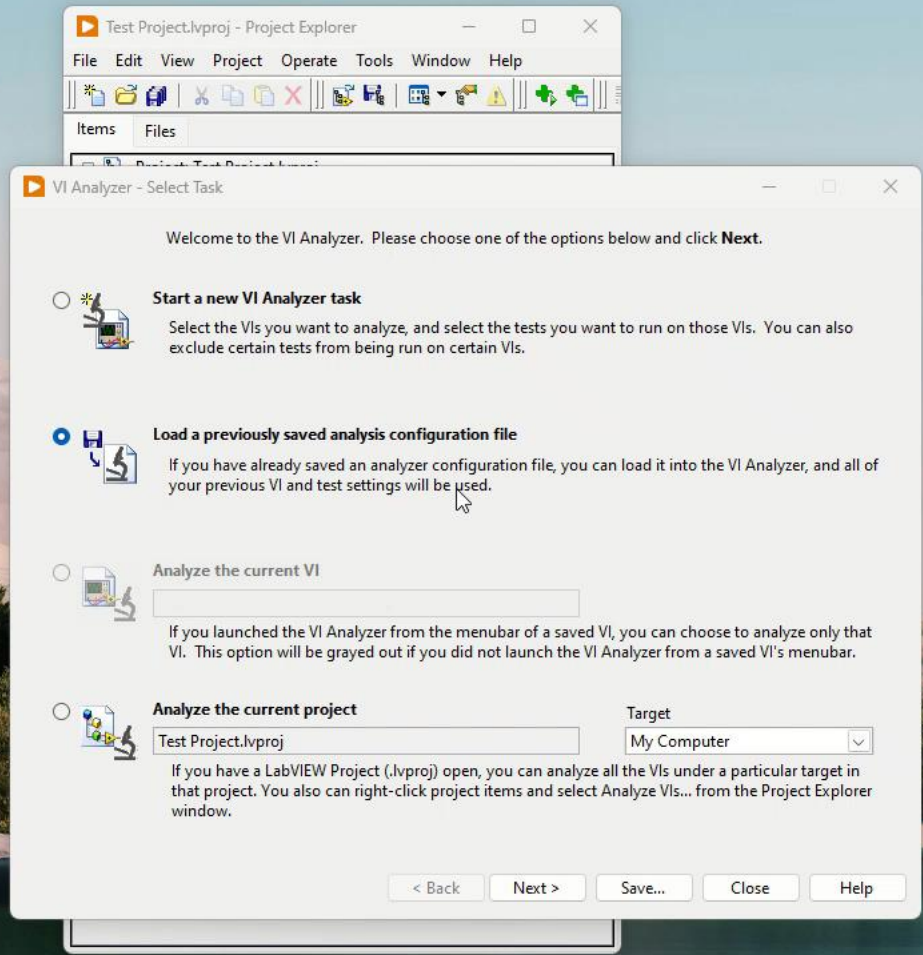
Double-click a failure occurrence to highlight the failure object in the VI. If the VI changed since you performed the analysis, the wrong object may be highlighted.

Results List	Subitems
! Hidden Objects in Structures	2
Coercion Dots	1
Comment Usage	4
Default Right-click Menus	2
Find User Visible Strings	5
Front Panel Property and Invoke Nodes	1
Gather Error Ring Data	2
In Place Element Structure Usage	1
Overlapping Controls	1
Separate Compiled Code	6
String Case Structure Matching	1
String Constant Build Path	1
Subdiagram Labels	6
Typedef Enums and Clusters	2
Wire Bends	4
Wired Terminals in Subdiagrams	1
i Backwards Wires	2
i Control Terminal Wiring	1

Show Failures Only     Sort by VI    ! - High Rank Test  
 Sort by Test    i - Low Rank Test

Description

Export... Load... Save... Done Help



# 2 - DQMH Validation



- DQMH is a free LabVIEW framework that offers:
  - Automated scripted code
  - Built-in API Testers
  - Cloneable modules
  - Asynchronous development
  - Mature toolchain
- Wired-in is a DQMH Trusted Advisor
- The DQMH Validation tool analyses a DQMH module and suggests fixes to implement the improvements from the newer versions.
- Ref link:  
<https://documentation.dqmh.org/dqmh/latest/ValidatinganExistingDQMHModule.html>

DQMH Validation Results

Module	Issue	Category
Device Module Template (Cloneable).lvlib	Missing Core DQMH Files	DQMH Library
Device Module Template (Cloneable).lvlib	Missing Code to Show Main VI diagram on initialization	Start Module VI
Device Module Template (Cloneable).lvlib	Stop Module - Event File Ordering	Stop Module VI

Details

The following core DQMH files were not found in the DQMH module library:

**Null Broadcast Events--constant.vi**

This module was created in a previous DQMH version, and these files are required for some DQMH Validate Module features in the current DQMH version.

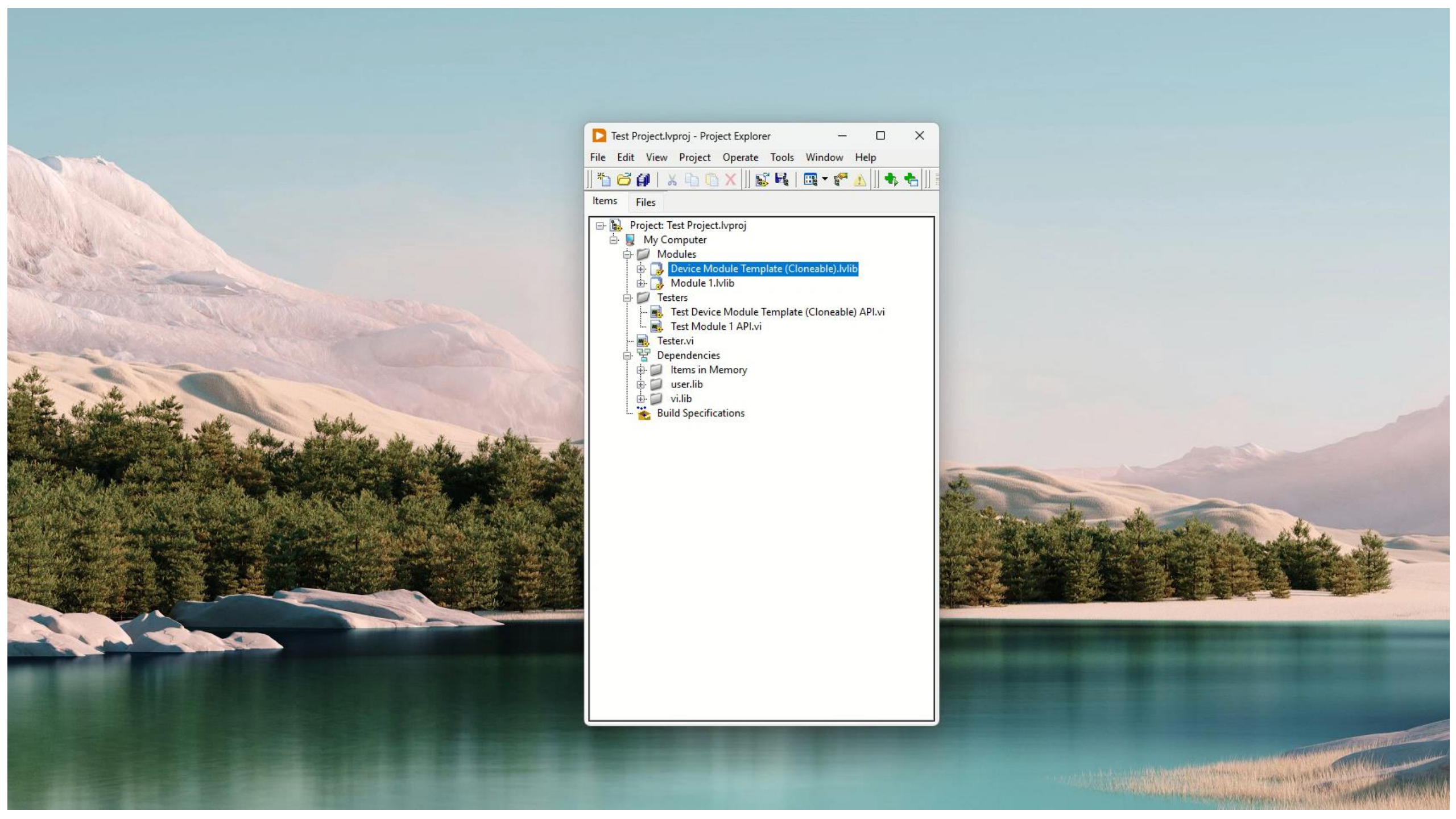
Click the **Fix Issue** button below to add the missing files to your DQMH module.

Fix Issue

Select any **Issue** to get more information in the **Details** section. Click **Rescan Current Module(s)** to verify any fixes that are performed. To ignore a failure in the future, right-click and select **Ignore this Failure**.

Validate Another Module      Rescan Current Module

Manage Ignored Failures...      Close      Help



Test Project.lvproj - Project Explorer

File Edit View Project Operate Tools Window Help

Items Files

- Project: Test Project.lvproj
  - My Computer
    - Modules
      - Device Module Template (Cloneable).lvlib
      - Module 1.lvlib
    - Testers
      - Test Device Module Template (Cloneable) API.vi
      - Test Module 1 API.vi
    - Tester.vi
    - Dependencies
      - Items in Memory
      - user.lib
      - vi.lib
    - Build Specifications





# 3 - Antidoc

- Open-source LabVIEW project documentation tool
- Wovalab has a patreon page – please go and support them
- Helps onboard new resource
- Ref link: <https://wovalab.gitlab.io/open-source/labview-doc-generator/page/about/>
- Download link: [https://www.vipm.io/package/wovalab/lib\\_antidoc/](https://www.vipm.io/package/wovalab/lib_antidoc/)

Table of Contents

1. Project description
2. DQMH modules
- 2.1. Preamble
- 2.2. Module overview
- 2.3. Device Module Template (Cloneable) info
- 2.4. Module 1 info
3. Libraries
- 3.1. Device Module SubVIs info
4. Classes
- 4.1. Classes overview
- 4.2. Device\_Parent\_1.vclass
- 4.3. Device\_Brand\_1.vclass
- 4.4. Device\_Brand\_Simulator.vclass
- 4.5. Device\_Variant\_1.vclass
5. Custom errors
6. Legal Information
- 6.1. Document creation
- 6.2. Product used in the project

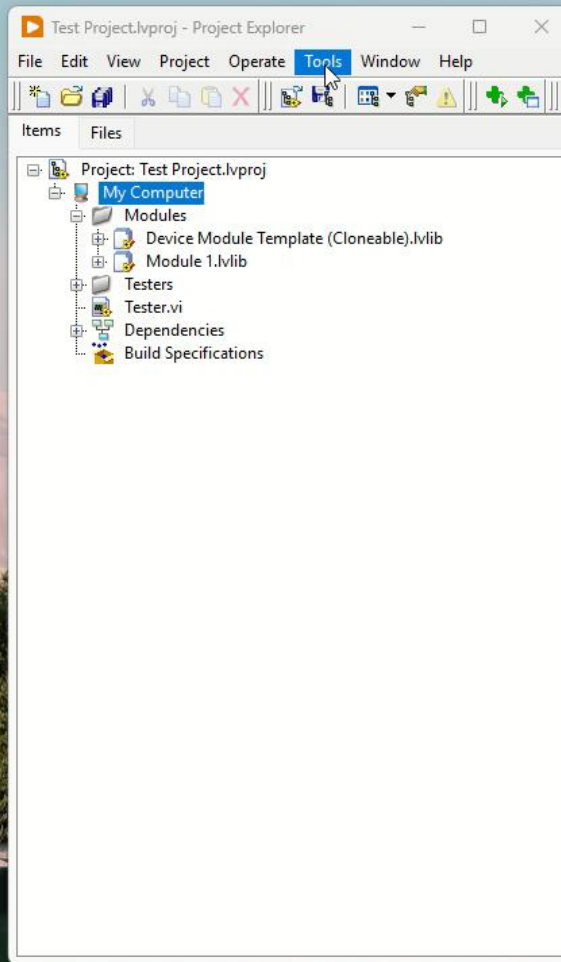
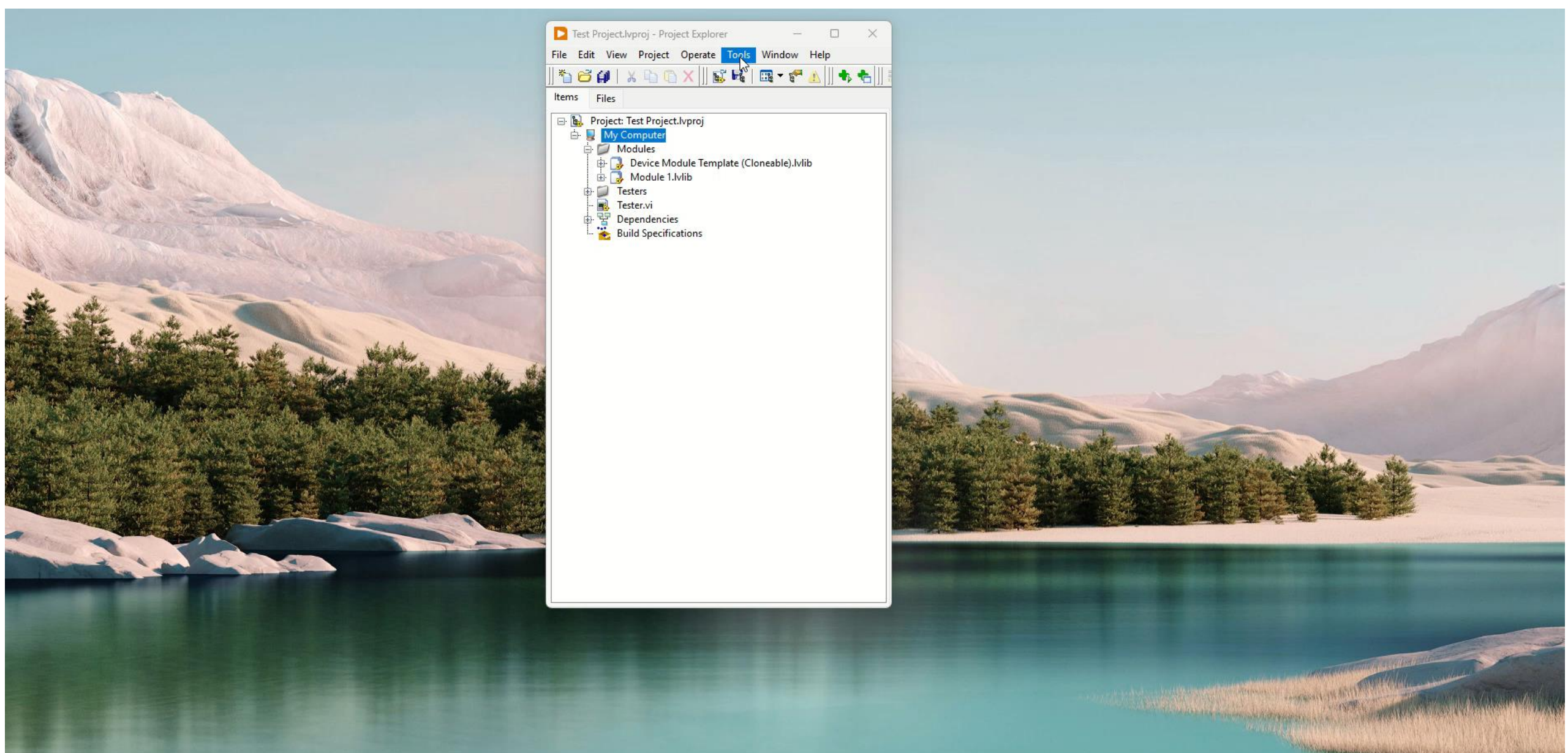
### 2.3.1. Event list

Table 2. Events

Name	Type	Connector pane	Description	S	R	I
Start Module			Launches the Module Main.vi.			
Stop Module			Sends the Stop request to the Module's Main.vi. If <b>Wait for Module to stop?</b> is TRUE, then this VI will not complete execution until the Module Main VI has stopped running. <b>Note:</b> If the cloneable module is running as singleton, then the "Wait for Module to stop" input is ignored... this VI will <b>always</b> wait until a cloneable Main VI running as singleton has stopped running. <b>Note:</b> This VI was modified by the <b>Validated DQMH Module</b> tool to upgrade it to the DQMH 6.0 approach to poll the execution state of a cloneable module running as singleton to know when the module has gone idle. <b>Note:</b> This VI was modified by the <b>Validated DQMH Module</b> tool to upgrade it to the DQMH 5.0 approach to destroying cloneable module event references.			
Show Panel	oa		Sends the Show Panel request to the Module's Main.vi.			
Hide Panel	oa		Sends the Hide Panel request to the Module's Main.vi.			
Show Diagram	oa		This VI tells the Module to show its block diagram to facilitate troubleshooting (add probes, breakpoints, highlight execution, etc).			
Insert Main Front Panel Into a Subpanel	oa		Inserts the main front panel into a subpanel			
Initialise Settings	oa		Initialises the settings for the meter in readiness for use.			
Lock Controls On Front Panel	oa		Locks (disables and greys out) all controls on the front panel			
Module Did Init	js		DQMH broadcast: notify module did init -Developed by Wired-in Software Pty Ltd, 19/10/2023 3:47:31 PM			
Status Updated	js		DQMH broadcast VI: Status updated -Developed by Wired-in Software Pty Ltd, 19/10/2023 3:47:57 PM			
Error Reported	js		<b>Note:</b> This VI was modified by the <b>Validated DQMH Module</b> tool to parse additional information log-out of the incoming error source string.			
Module Did Stop	js		No description found (add content in vi description)			
Update Module Execution Status	js		No description found (add content in vi description)			
Wake Up Helper Loop	oa		Wakes up the helper loop			

Type oa → Request !% → Request and Wait for Reply js → Broadcast  
Scope of → Protected of → Community  
Reentrancy @ → Preallocated reentrancy @ → Shared reentrancy  
Inlining in → Inlined

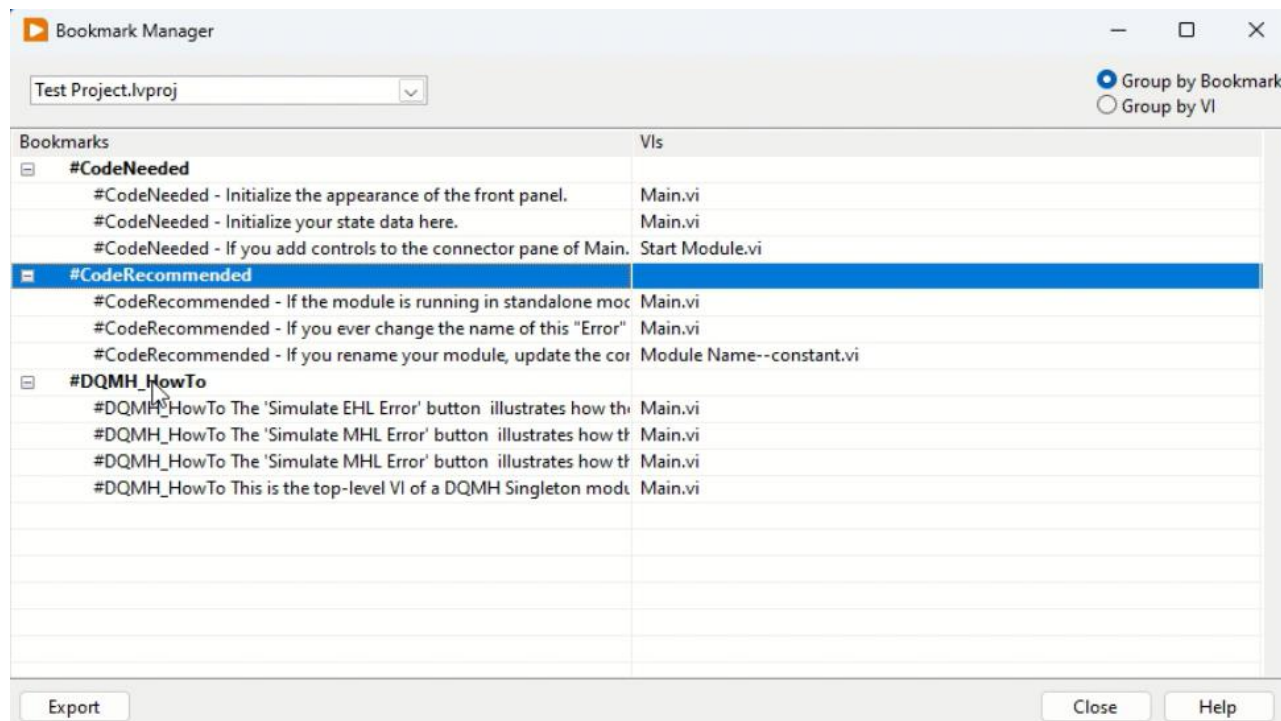
### 2.3.2. Module relationship

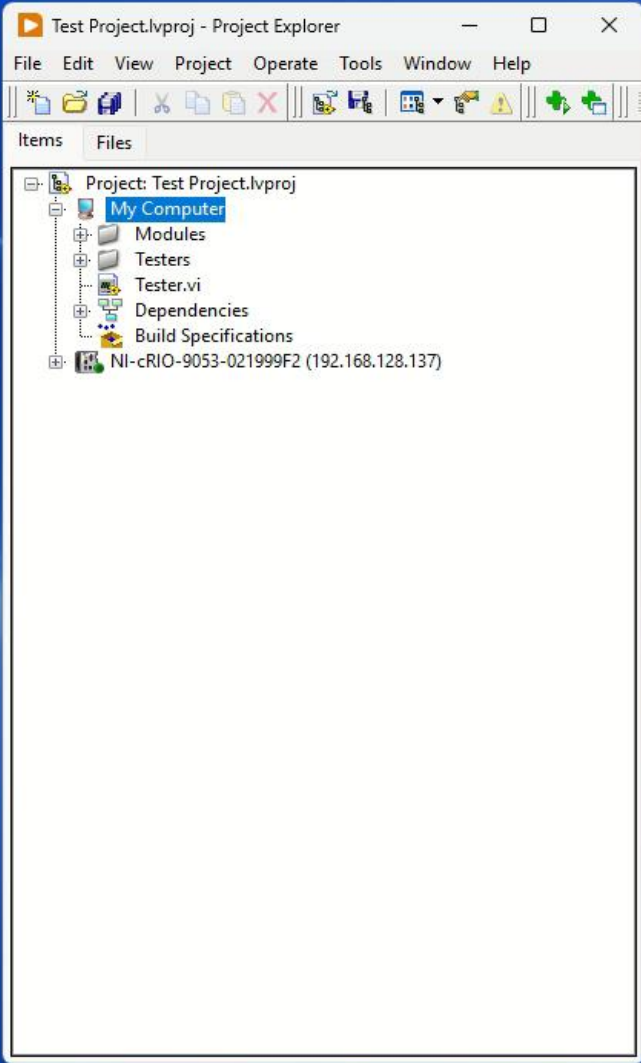




# 4 - Bookmark Manager

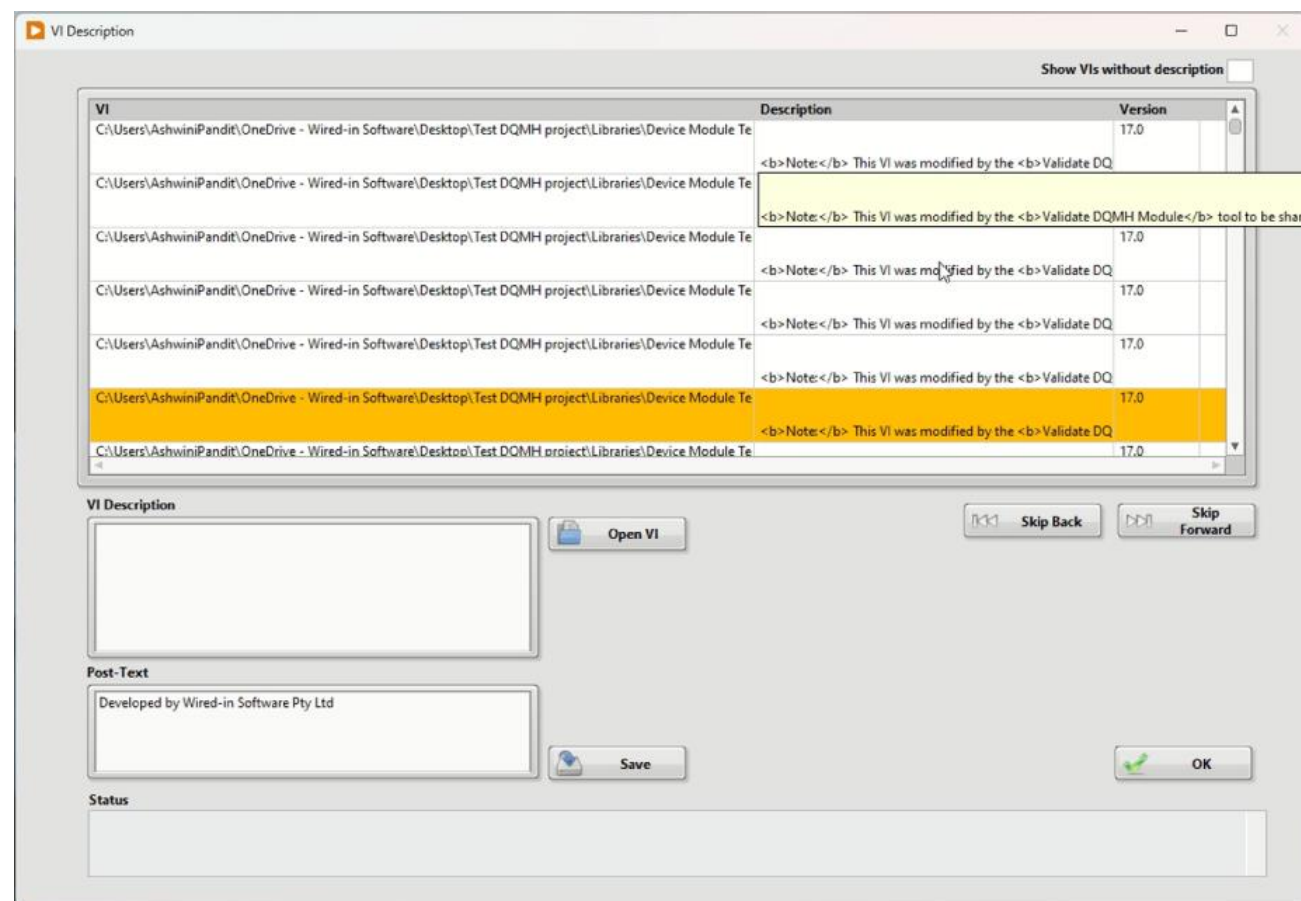
- Any text that starts with a hashtag ( # ) will automatically be identified by LabVIEW as a bookmark
- Find and display all [bookmarks](#) in your application instance
- Marking to-do items or unfinished tasks, e.g., #Todo, #Notes, etc
- Ref link:  
<https://forums.ni.com/t5/Developer-Center-Resources/Creating-a-Custom-Bookmark-Manager-for-LabVIEW/ta-p/3513079>





# 5 - VI Description Documenter

- VI Descriptions make for more readable code
- VI Analyser can find VIs that don't have the VI Description filled in.
- Clunky to perform a bulk edit
- We have a basic tool to help us edit them one after the other



Show VIs without description

VI	Description	Version
C:\Users\AshwiniPandit\OneDrive - Wired-in Software\Desktop\Test DQMH project\Libraries\Device Module Te		17.0
C:\Users\AshwiniPandit\OneDrive - Wired-in Software\Desktop\Test DQMH project\Libraries\Device Module Te	<b>Note:</b> This VI was modified by the <b>Validate DQ	
C:\Users\AshwiniPandit\OneDrive - Wired-in Software\Desktop\Test DQMH project\Libraries\Device Module Te	<b>Note:</b> This VI was modified by the <b>Validate DQMH Module</b> tool to be shared clone reentrant.	
C:\Users\AshwiniPandit\OneDrive - Wired-in Software\Desktop\Test DQMH project\Libraries\Device Module Te		17.0
C:\Users\AshwiniPandit\OneDrive - Wired-in Software\Desktop\Test DQMH project\Libraries\Device Module Te	<b>Note:</b> This VI was modified by the <b>Validate DQ	17.0
C:\Users\AshwiniPandit\OneDrive - Wired-in Software\Desktop\Test DQMH project\Libraries\Device Module Te	<b>Note:</b> This VI was modified by the <b>Validate DQ	17.0
C:\Users\AshwiniPandit\OneDrive - Wired-in Software\Desktop\Test DQMH project\Libraries\Device Module Te	<b>Note:</b> This VI was modified by the <b>Validate DQ	17.0
C:\Users\AshwiniPandit\OneDrive - Wired-in Software\Desktop\Test DQMH project\Libraries\Device Module Te	<b>Note:</b> This VI was modified by the <b>Validate DQ	17.0
C:\Users\AshwiniPandit\OneDrive - Wired-in Software\Desktop\Test DQMH project\Libraries\Device Module Te	<b>Note:</b> This VI was modified by the <b>Validate DQ	17.0

VI Description

Empty text box for VI description.

Open VI

Skip Back

Skip Forward

Post-Text

Developed by Wired-in Software Pty Ltd

Save

OK

Status

Empty text box for status.

# 6 - Nattify

- Tool originally created by Darren Nattinger and later contributed by many LabVIEW developers to modify VI properties and VI appearance in order to follow your/companies IDE preferences
- <https://forums.ni.com/t5/Quick-Drop-Enthusiasts/Quick-Drop-Keyboard-Shortcut-Nattify-VI/td-p/3990402>
- Installation Instructions:  
<https://forums.ni.com/t5/Quick-Drop-Enthusiasts/How-to-install-a-Quick-Drop-Keyboard-Shortcut-plugin/m-p/3896383>



Auto Error Handling
Autogrow
Front Panel Color
Icon View
Move Error Wires Back
Remove (no error)
Subdiagram Label Justify
Terminal Labels on Side
Terminal Labels Transparent
Arrange FP
Arrange BD

Configuration About

Project File Path

C:\Users\AshwiniPandit\OneDrive - Wired-in Software\Desktop\Test DQMH project\Test Project.lvproj

Config File Path

C:\Users\AshwiniPandit\OneDrive - Wired-in Software\Desktop\Test DQMH project\Quality Check Config.ini

Configuration

**Autorun**

**Note:** Autorun decides whether to run a tool without user intervention and save results for further analysis

**VI Analyzer**

VI Analyzer cfg File Path

C:\Users\AshwiniPandit\OneDrive - Wired-in Software\Desktop\Test DQMH project\WIS default VI Analyzer Config File.viancfa

**Nattify**

Select Nattify Tests

- Auto Error Handling
- Autogrow
- Front Panel Color
- Icon View
- Move Error Wires Back
- Remove (no error)
- Subdiagram Label Justify
- Terminal Labels on Side
- Terminal Labels Transparent
- Arrange FP
- Arrange BD

Ignore 'Arrange FP' test for VIs containg string:

API.vi  
.lib:Main.vi  
.lib:Main.vi

**Note:** Commit your source code before running Nattify test.

**Antidoc**

Antidoc Configuration

Email: apandit@wiredinsoftware.com.au

Commit: 711b1daefc056428b6225fa78090ff129a7de34

Tag: -main

Author: Ashwini

**Version Info**

Application Decription

Test List

- Bookmark Manager
- LabVIEW Options
- LabVIEW Options
- LabVIEW Options
- LabVIEW Options
- LabVIEW Options
- LabVIEW Options
- LabVIEW Options
- LabVIEW Options

Update Config

**Bookmark Manager**

Target Name: My Computer

Ignore Bookmarks:

- #DQMH\_HowTo
- #CodeRecommended

**Note:** Ignores selected bookmarks if Autorun is True

Status

RUN EXIT

# WiS Code Quality Check Tool





# Demo

Code Quality Check Tool

**Configuration** **About**

**Project File Path**  
 ...

**Config File Path**

**Configuration**

**Autorun** **Note:** Autorun decides whether to run a tool without user intervention and save results for further analysis

**VI Analyzer**  
 VI Analyzer cfg File Path  
 ...

**Nattify**  
 Select Nattify Tests

Auto Error Handling	<input checked="" type="checkbox"/>
Autogrow	<input checked="" type="checkbox"/>
Front Panel Color	<input checked="" type="checkbox"/>
Icon View	<input checked="" type="checkbox"/>
Move Error Wires Back	<input checked="" type="checkbox"/>
Remove (no error)	<input checked="" type="checkbox"/>
Subdiagram Label Justify	<input checked="" type="checkbox"/>
Terminal Labels on Side	<input checked="" type="checkbox"/>
Terminal Labels Transparent	<input checked="" type="checkbox"/>
Arrange FP	<input checked="" type="checkbox"/>
Arrange BD	<input type="checkbox"/>

Ignore 'Arrange FP' test for VIs containing string:

**Note:** Commit your source code before running Nattify test.

**Antidoc Configuration**  
 Email  
  
 Commit  
  
 Tag  
  
 Author

**Bookmark Manager**  
 Target Name  
  
 Ignore Bookmarks

**Note:** Ignores selected bookmarks if Autorun is True

**Test List**


- LabVIEW Options
- LabVIEW Options
- LabVIEW Options
- LabVIEW Options
- LabVIEW Options
- LabVIEW Options
- LabVIEW Options
- LabVIEW Options
- LabVIEW Options
- LabVIEW Options

**Update Config**

**Version Info**  
 Application Description

**Status**

**RUN** **EXIT**

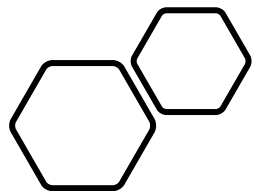
Developed by Wired-in Software Pty Ltd 

Test DQMH project

The screenshot shows a Windows File Explorer window titled 'Test DQMH project'. The window displays a list of files and folders within the project directory. The 'Quality Check' folder is currently selected and highlighted. The status bar at the bottom indicates '10 items' and '1 item selected'.

Name	Status	Date modified	Type	Size
Libraries	✓	29/08/2023 8:39 AM	File folder	
Quality Check	✓	5/10/2023 3:35 PM	File folder	
Code_Review_Checklist.csv	✓	5/10/2023 4:19 PM	Microsoft Excel C...	3 KB
Quality Check Config.ini	✓	5/10/2023 4:18 PM	Configuration sett...	2 KB
Test Project.aliases	✓	5/10/2023 4:39 PM	ALIASES File	1 KB
Test Project.lvmps	✓	5/09/2023 2:20 PM	LVLPS File	1 KB
Test Project.lvproj	✓	5/09/2023 2:20 PM	LabVIEW Project	113 KB
Tester.vi	✓	5/10/2023 4:21 PM	LabVIEW Instrume...	8 KB
Version_Info.csv	✓	20/09/2023 12:37 PM	Microsoft Excel C...	1 KB
WIS default VI Analyzer Config File.viancfg	✓	29/08/2023 9:36 AM	VIANCFG File	61 KB





# 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)

