

# MicroScope 2.0

MicroScope 2.0 is a diagnostic tool used in conjunction with MicroStation and other Bentley products. It is useful when creating custom tools, performing various “debugging” operations, and while creating scripts for the batch processor. It displays and records a range of user-specified events, offering real-time insights about MicroStation’s internal operation. MicroScope users may peruse detailed information on elements, active settings, the .dgn file and the host application.

MicroScope 2.0 is an open-source applet written in VBA and is freely available to users of Bentley software.



## Installation

The applet should be installed in a location defined by the MicroStation variable MS\_VBASEARCHDIRECTORIES, although any location where the user has read access will suffice.

Typical locations include:

```
C:\ProgramData\Bentley\MicroStation CONNECT Edition\Configuration\Organization\Macros
```

```
C:\ProgramData\Bentley\MicroStation CONNECT Edition\Configuration\WorkSpaces\WorkspaceName\Standards\Macros
```

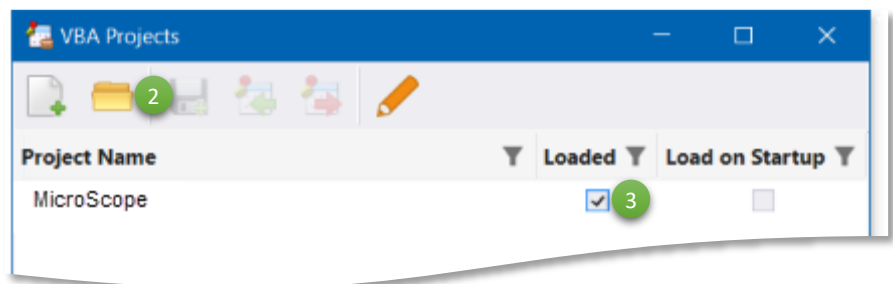
```
C:\ProgramData\Bentley\MicroStation CONNECT Edition\Configuration\WorkSpaces\WorkspaceName\WorkSets\WorkSetName\Standards\Macros
```

To install, unzip the contents of the distribution file to a folder of your choice.

## Startup

The applet may be started via the VBA Projects dialog:

1. From the Utilities tab of MicroStation’s ribbon select the *VBA Manager*.
2. Select *Open VBA Project from Disk* and navigate to the installation location. Choose **MicroScope.mvba** and then select *Open*. The applet will automatically run upon load.
3. Unchecking and rechecking “Loaded” will re-launch the applet after it has been terminated.



Key-ins may also be used to launch the applet:

- If the applet is already loaded or installed in a directory defined by MS\_VBASEARCHDIRECTORIES, use the key-in:  
`vba run [MicroScope]Main.StartMicroScope`  
(recommended)
- To load and run the application from any location use the key-in:  
`vba load "C:\Path to File...\MicroScope.mvba"` *Note: This key-in will not start the applet if it is already loaded.*

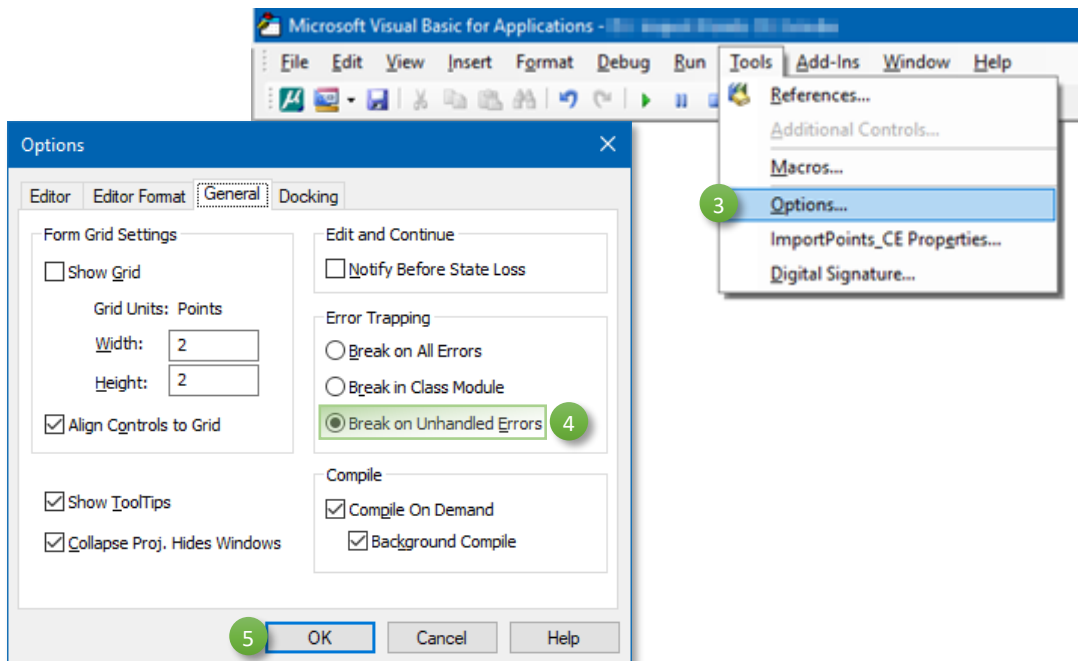
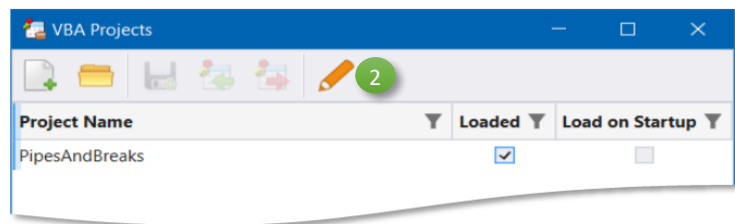
- Use this concatenation of the preceding key-ins if you wish to load, launch (or re-launch if already loaded) the applet from a custom menu/tool and it is not installed in a directory defined by MS\_VBASEARCHDIRECTORIES:  
`vba load "C:\Path to File...\MicroScope.mvba";vba run [MicroScope]Main.StartMicroScope`
- Should you need to reset MicroScope, after the applet is loaded, use the key-in:  
`vba run [MicroScope]Main.ResetMicroScope` or play the macro ResetMicroScope. This will cause MicroScope to start up in its default position with “Out-of-the-box” settings.

## Environment Settings

MicroScope has “built-in” error detection. Consequently, *Error Trapping* in Microsoft’s Visual Basic for Applications integrated development environment should be set to *Break on Unhandled Errors*.

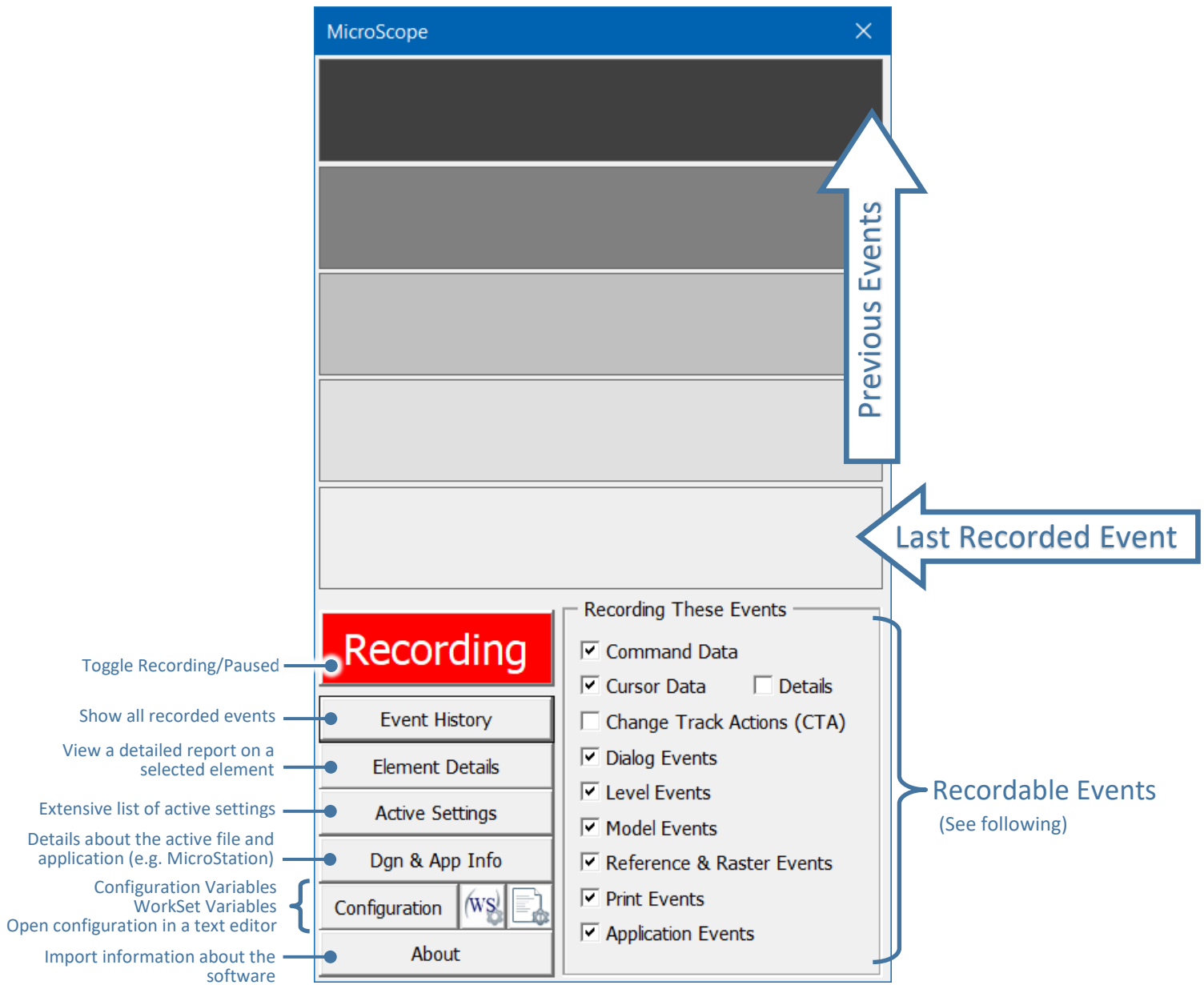
To adjust this setting:

- 1) Open the VBA Manager (VBA Projects) from the *Utilities* tab in the MicroStation ribbon.
- 2) From the VBA Projects dialog select the *Show the VBA Editor* icon. (This action requires a project is already loaded.)
- 3) Select *Options* from the *Tools* pull-down menu in the *Microsoft Visual Basic for Applications* window.
- 4) Under *Error Trapping* on the *General* tab of the Options dialog, select *Break on Unhandled Errors*.
- 5) Select **OK**



## MicroScope UI

The MicroScope UI consists of the primary “MicroScope” form and the “MicroScope Info” form. The primary form contains various controls, recording settings and a record of the last five recorded events. The “MicroScope Info” form contains the complete history of recorded events, details of selected elements and information on the active settings, current design file and application.



*The primary MicroScope form*

### Recordable Events

- **Command Data** — This is information that flows through the CAD input queue. It is useful for discovering the “key-in behind the button.” Not all MicroStation commands/operations flow through this queue.
- **Cursor Data** — Type of cursor input (e.g. datapoint).
- **Details** — Record of where the cursor event transpired. This includes the view, screen point, raw coordinate and final (snapped) coordinate. When disengaged, repeated data points (e.g. while placing a line string) are not individually recorded and are combined into a single record noting the multiple events.

- **Change Track Actions (CTA)** — “Behind-the-scenes” design file operations.
- **Dialog Events** — Details of dialog box operations (open/close) and dialog results (e.g. Cancel).
- **Level Events** — Including create, delete and various changes.
- **Model Events** — Details of various model operations (e.g. Create, Activated, etc.)
- **Reference Events** — Details of reference attachments, detachments, and modifications.
- **Print Events** — Details of print events.
- **Application Events** — Design file open/close.

MicroScope Info

Event History | Element Details | Active Settings | Dgn & App Info | About

Active Design File: ArchitecturalSheets.dgn  
 Active Model: Cover Sheet  
 Model Type : Sheet

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ATTRIBUTES

Color: -1 (RGB: 0, 0, 0)  
 Color Name: -1  
 Level: Plan Border  
 Line Style: STYLE\_ByLevel  
 Line Weight: 2  
 Display Priority: 0  
 Element Class: Primary  
 Transparency: 0  
 Element Template Association: False  
 Element Template Path:  
 Fill Mode: 0  
 Fill Color: 0 (RGB: 255, 255, 255)  
 Area Mode Hole: False

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UNITS

Master unit label: mm  
 Master unit system: Metric  
 Master unit base: Meter  
 Master unit, units per base numerator: 1000  
 Master unit, units per base denominator: 1

Sub unit label: um  
 Sub unit system: Metric  
 Sub unit base: Meter  
 Sub unit, units per base numerator: 1000000  
 Sub unit, units per base denominator: 1

Refresh

*The MicroScope Info form*

Information on the *Event History* tab is dynamically updated as events are recorded. The *Element Details* tab is appended with additional information when the *Element Details* tool is used. The *Active Settings* and *Dgn & App Info* tabs will display current information when they are opened and may be manually updated by pressing the “Refresh” button.

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