

# InSight Desktop User's Guide

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wireless semiconductor solutions

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## About InSight™

InSight is Ember's integrated network debug environment, which ties together firmware and hardware components of Ember carrier boards, and InSight Desktop software:

- **Ember carrier boards** are test beds for developing and deploying a ZigBee application. The breakout board for the EM250 and EM260 provides a direct attachment to the radio communication module. It also contains components for prototyping and testing an embedded wireless application, such as a temperature sensor, two buttons, a piezo buzzer, two LEDs, and a 2" x 2" through-hole prototyping area.
- **Ember radio communication module (RCM)** offers a complete ZigBee wireless solution for development and deployment of a low-data-rate, low-power ZigBee application. The four-layer (FR4) RCM features the Ember EM250 or EM260 radio chip, a 2.4GHz, IEEE 802.15.4-2003 SOC that runs the ZigBee-compliant EmberZNet stack.
- **InSight Adapter** (in earlier Ember releases, the emulator debug module) connects the RCM to the Ethernet. It collects network data over the InSight Port cable connection and conveys it over its Ethernet connection to InSight Desktop. It also delivers messages and new software that are addressed to the RCM or its breakout board.
- **InSight Desktop** is a graphical tool that displays network and node activity in real time.

For detailed information about the EM250 and EM260 breakout boards, and InSight Adapter and InSight Port, refer to their technical specifications.

### Licensed editions

Depending on your license, you have one of the following InSight Desktop editions:

- **Professional Edition** provides unlimited access to all InSight Desktop features and functionality.
- **Developer Edition** provides access to all InSight Desktop features. This edition allows up to three adapter [connections](#), and a maximum of 10,000 events in any given [capture session](#).

For more information about obtaining and installing an InSight Desktop license, see the [next section](#).

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## Obtaining a license

When you install InSight Desktop, you initially have a trial license that is good for 30 days. The following directions tell you how to obtain a permanent license.

### After you install InSight Desktop...

Immediately after you install InSight Desktop, follow these steps:

1. Start InSight Desktop.
2. Choose the menu option **File | Preferences**
3. Choose **Licensing**
4. Copy the Node Key value and paste it into the body of an email message to [support@ember.com](mailto:support@ember.com). The message should also contain:
  - **ISD license request** in the subject line
  - **Your company's name** in the message body

### After you receive the license file...

After you submit your request, you should receive a license file from Ember support within one or two business days. After you receive this file:

1. Save the license file to your hard disk.
2. Start InSight Desktop.
3. Choose the menu option **File | Preferences**
4. Choose **Licensing**
5. Click **Browse** and navigate to the license file.
6. Open the license file.
7. In the Licensing dialog, click **OK**

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## InSight Desktop features

InSight Desktop provides a rich and flexible interface to Ember embedded networks, which helps you develop and debug new network applications. InSight Desktop includes these features:

- Multiple editor panes that provide tiered views of network activity, letting you drill down from a high-level map of node interactions to the details of each packet.
- Customizable filters that let you specify exactly which network activities to display.
- Log files that save captured data, so you can step through transactions and events for detailed analysis.
- A file browser that lets you easily upload new applications to any connected node.
- A browser-based interface for automatic discovery of Ethernet-connected adapters, and easy management of adapter applications.

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## Quality of network data

The types of network activity that InSight Desktop obtains from an Ember node depends on its radio chip and InSight adapter. Depending on the development kit, Ember nodes support one of the following radio chips:

- [EM250/EM260](#)
- [EM2420](#)

Both are accessible to InSight Desktop, and relay information about debug applications. Their differences are detailed in the following sections.

### EM250/EM260

The EM250 and EM260 radio chips provide special hardware and firmware for collecting network-level debug information. Their packet trace circuit acts like an on-chip sniffer and relays all packets that the RCM sends or receives, regardless of the application that is running on it.

### EM2420

The EM2420 has two versions of InSight Adapter, which determine its data delivery capabilities:

- **0221:** When the RCM is running a sniffer application, all radio packets are relayed to InSight Desktop.
- **0222:** All radio packets are relayed to InSight Desktop, whether or not the message passed the CRC check. Messages that fail the CRC check are shown by InSight Desktop in the Event panel; however, because their content is considered corrupt, InSight Desktop does not provide decoded content.

## Navigating InSight Desktop

The InSight Desktop environment contains the following work areas:

- **Adapters view** lists all adapters and their nodes that are accessible to InSight Desktop.
- **Capture sessions** contain data captured from a node or set of nodes.
- **Editor panes** display the data of a given capture session.

### Adapters view

On startup, InSight Desktop automatically discovers and lists all InSight adapters that are connected to the local subnet. You can also [configure InSight Desktop to discover InSight adapters](#) on other subnets.

#### Default and custom groups

When you first start InSight Desktop, it displays in a single default group all InSight adapters that are discovered by InSight Desktop. You can [create custom folders](#) and move InSight adapters to them:

**NOTE:** Custom folders have no functional impact on adapters or their interaction.

#### Adapter details

You can expand each InSight adapter to display the following details about it:

- **IP Address and Adapter Name** identify this InSight adapter.
- **Software Version** shows which version of InSight Adapter is running on this adapter.
- **Last Connect IP** shows the IP address of the last InSight Desktop host to connect to this InSight adapter.
- **In Use** is set to true or false to indicate whether another user is connected to this InSight adapter. If the adapter is in use, a lock icon appears next to it. Only one instance of InSight Adapter can be connected to an adapter at any given time. If you connect to an adapter that is in use, the previous user is automatically disconnected.
- **Board Type** identifies this [adapter's platform](#).
- **Last Upload** identifies the application that you last uploaded to this adapter's node. If another user uploaded an application to the node, or if InSight Desktop is unable to identify the application for some other reason, this field displays Unknown.

### Capture sessions

InSight Desktop can display one or more capture sessions. Each capture session displays the data captured from one or more nodes. The captured data is shown in one or more [editor panes](#).

InSight Desktop supports two types of capture sessions:

- **Live sessions** display data as it is captured; the display is continuously refreshed as new data arrives. InSight Desktop maintains one live session at a time; when it starts, the live session is unnamed, and its data is maintained in temporary storage until you save it to a named file.

- **Saved sessions** contain captured data that has been saved to permanent storage in a named `.isd` file. You can load a saved session and [play it back](#) at any time.

InSight Desktop displays each session with its own tab. The tab of each saved session is labeled with the session's file name; the live session is labeled Live.

When you start InSight Desktop, it opens a new live session and any saved sessions that were displayed when you last exited.

## Editor panes

Editor panes display different views of capture session data. Up to five editor panes can be open at any one time:

- **Map** provides a graphical view of the network, where nodes are displayed with their network identifiers. The map also displays network activity.
- **Transactions** displays high-level node interactions that might comprise multiple events.
- **Events** displays information about all packets transmitted and received during a capture session.
- **Event Detail** displays the decoded contents of the packet that is currently selected in the Events pane.
- **Hex Dump** displays the data of the selected event in raw bytes. InSight Desktop highlights bytes that map to the data currently selected in the Event Detail pane.

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## Interacting with InSight Adapters

The following sections discuss the adapter actions that you can initiate and control through InSight Desktop. These actions are accessible through the context menu that you invoke by right-clicking on selected InSight adapters or an [adapter group](#).

**NOTE:** Information about capturing network data from an adapter's node is discussed [separately](#).

Most commands can be issued to multiple adapters simultaneously. You can select multiple adapters in one of two ways:

- Select individual adapters:
  - For contiguous selections, Shift+Click
  - For non-contiguous selections, Ctrl+Click
- Select one or more [adapter groups](#) to select all adapters within those groups.

### Connect

In order to interact with any adapter, you must establish a connection between it and InSight Desktop. When you connect to an adapter, InSight Desktop opens the TCP/IP socket connections that it requires in order to communicate with [InSight Adapter](#).

**NOTE:** Before you connect, disable the Windows Firewall in order to allow connections to ports 4900-5000.

When you disconnect InSight Desktop from an adapter, it closes the TCP/IP socket connections. If any [capture](#) is in progress from that adapter's node, it stops the capture first.

### Make into a Sniffer

The node of any adapter that InSight Desktop is connected to can be designated as a sniffer. A sniffer node is capable of [capturing](#) all data that is transmitted among nodes over the designated channel.

A sniffer node must have a sniffer application loaded on its RCM:

- If no sniffer application is currently loaded, InSight Desktop prompts you to select an application that is compatible with this node. It uploads your selection to the RCM.
- If the node already has a sniffer application, InSight Desktop asks whether you wish to upload a new sniffer application. If you reply no, InSight Desktop activates the node as a sniffer with the current sniffer application.

After you designate a node as a sniffer, you can start using it to [capture network data](#).

### Upload Application

Upload Application lets you upload an application to the node of the selected adapters. If uploading to an EM2xx node, InSight Desktop checks whether any [application upload preferences](#) are set.

**CAUTION!** Be sure that the application you upload is compatible with the architecture of the target node. For more information, refer to Application Note 5022, *Programming and Using the Application Bootloader*.

If you upload to an EM260 node, InSight Desktop displays a dialog that asks you to choose between two possible upload targets:

- **Upload Host Processor** lets you upload an application image to the host microcontroller.
- **Upload Network Co-processor** lets you upload a new image to the EM260 network co-processor.

### Reset Node

If a node is in an inconsistent state, you can reset its RCM with this command, which pulls down its reset line for a millisecond.

### Power Node On/Off

You can power on or off any connected node from InSight Desktop. If you are capturing data from that node, the capture is suspended, and resumes when the node powers up again.

### Reset InSight Adapter

This menu option resets the TCP/IP socket connections that InSight Desktop created when it [connected](#) to this adapter.

### Upload Adapter Firmware

Use this option to upgrade InSight Adapter firmware.

## Capturing and saving data

You can capture data from the node of any [connected](#) InSight adapter: from one node at a time, or multiple nodes simultaneously. You can also capture all network traffic over the current channel by capturing data from a connected [sniffer](#) node.

**NOTE:** The types of data that are captured from a node depends on the [capabilities](#) of its radio chip and InSight adapter.

To start a capture:

1. Select one or more [connected](#) adapters.
2. Right-click on the selected adapters.
3. From the context menu, choose **Start Capture**

### Capturing from a sniffer node

A sniffer node has a [sniffer application loaded](#) on its RCM, which enables it to capture all over-the-air transmissions between nodes over the designated channel.

When you start capturing from a sniffer node, it captures all packets that are exchanged by the nodes on the designated channel.

To discover available networks:

1. From the InSight Desktop toolbar, click the **Channel/PAN** button.
2. Select a sniffer node from the drop-down list and click **Scan**.

**NOTE:** If you select a node that is not a sniffer, InSight Desktop asks whether you wish to [upload a sniffer application](#) to it.

The selected sniffer scans all channels for networks that are within range, and lists their PAN ID and channel.

3. Choose a network from the list and click **OK**.
4. From the Adapters view, select the adapter of a sniffer node and from its context menu, choose **Start Capture**.

### Capturing from multiple nodes

You can capture data from multiple nodes simultaneously. This is typically done for nodes that belong to the same network.

To capture from multiple nodes:

1. Select the corresponding InSight adapters from the Adapters view:
  - For contiguous adapters, Shift+Click
  - For non-contiguous adapters, Ctrl+Click
2. Right-click on the selected adapters.

3. From the context menu, choose **Start Capture**

Alternatively, you can start a capture from all InSight adapters within a group, provided all adapters in the group are connected: right-click on the group folder and from the context menu choose **Start Capture**.

#### Perfect trace sessions

With the [EM250/EM260](#) and [EM2420/0222](#) platforms, InSight Desktop captures all incoming and outgoing packet data via the selected adapters, whether or not the host nodes have sniffer applications. The data includes failed transmissions, and debug messages from node applications that are compiled in debug mode.

Capturing from all nodes in a network yields a *perfect trace* session: the session data compiles all incoming and outgoing data from each node in chronological real time, providing a richly layered view of all activity within a network. This can be especially useful for debugging a network while it undergoes development.

**NOTE:** A [sniffer capture](#) intercepts all over-the-air transmissions among network nodes; however, the sniffer cannot detect any data transmissions that are known only to their senders such as messages that fail to arrive at their destination, and debug data such as API traces.

## Viewing captured data

All captured data is continuously updated and displayed in the following editor panes:

#### Map

The Map pane shows all interaction between nodes at a high level. Each node is represented by an icon. As events occur or are replayed, the map pane refreshes to show the pattern of network communication.

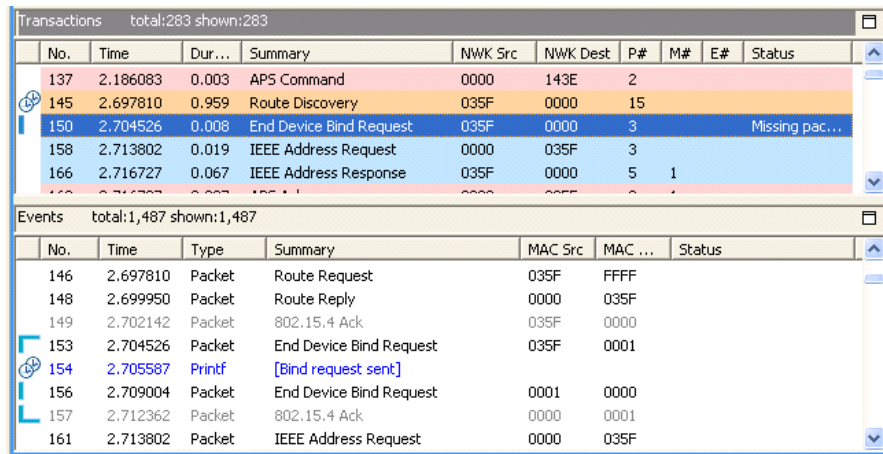
#### Transactions

The Transactions pane displays all event transactions. For example, all events that pertain to a node joining a network are regarded as a single Associate transaction. These events include all requests and replies that are sent by the node offering permission, and the node petitioning to join.

All transactions are listed in chronological order, using transaction start times. Each selection is marked and maps to one or more events in the Events pane, which are [marked](#) accordingly. All transactions and their events are numbered sequentially.

**NOTE:** If you have [filters](#) turned on, number gaps are likely to occur.

If transactions overlap, the **Events pane** uses clock icons to mark unrelated events that are concurrent with the selected transaction:



### Events

The Events pane displays information about packets received by the current session. All events are displayed in chronological order. Events that belong to a transaction are marked by one of the following icons:

Transaction icon	Meaning
	Start of transaction
	Intermediate event.
	End of transaction
	Single-event transaction

### Event Detail

The Event Detail pane displays the decoded contents of the packet that is currently selected in the Event view. The content of this pane varies according to the packet type.

### Hex Dump

The Hex Dump pane displays the data of the selected event in raw bytes. InSight Desktop highlights those bytes that map to data selected in the Event Detail pane.

### Clearing a session

Clear Events purges all events and their associated transactions from the current session. Unless previously saved to a session file, cleared events cannot be retrieved.

### Stopping a capture

Stop Capture ends the flow of network data to the current session. Start Capture resumes capturing to the live session.

## Saving a session

When you start a capture, it is initially written to an unnamed live session. At any point during a live session, you can save the data thus far captured to a file by choosing the menu bar option **File | Save**. After you save a session file, InSight Desktop continues to append capture data to it; however, you must save again in order to retain this data in the session file.

InSight Desktop closes a saved session from further captures after you explicitly [stop the capture](#), or when you start another live session. After a saved session is closed, it cannot be reopened to capture more data.

If you modify a saved session file—for example, set [bookmarks](#) or reposition icons in the map pane—InSight Desktop asks whether to save or discard those changes before you close the session.

### Multiple save

If multiple open sessions have unsaved data, you can save all of them at once by choosing **File | Save All**.

### Session file data

InSight Desktop saves session data to an `.isd` file, which is a compressed file that stores session data and the network state. Network state includes display settings such as map modifications, which InSight Desktop restores when you reload the session file.

### Open and close options

You can open any session file and review its contents by choosing **File | Open** and browsing to the desired file. For fast access, choose a recently viewed file from the File menu.

InSight Desktop provides several options for closing sessions:

- To close a single session, click on the session tab's close control.
- To close all sessions, right-click on any session tab and from the context menu choose **Close All**. Alternatively, choose the menu bar option **File | Close All**.
- To close all sessions except the current one, right-click on its session tab and from the context menu choose **Close Others**.

### Replaying a session

You can replay events of the current session, whether live or saved, by choosing **Edit | Start Replay**. InSight Desktop starts replaying the session from the selected event. Events are replayed at a constant speed. Replaying events in a live session has no effect on the capture in progress.

To stop the session replay, choose **Edit | Stop Replay**.

## Navigating a session

InSight Desktop provides several navigation tools that help you navigate through the current session:

- **Edit | Lock to Bottom** locks the cursor on the latest event during a live session. To break the lock, select any event or transaction.
- **Edit | Go to Line** moves the cursor to the specified line number.

- **Edit | Go to Time** moves the cursor to the transaction and event that match or immediately follow the specified time.

---

## Filtering captured data

By default, the Events pane displays all session events. You can build and apply filters that constrain InSight Desktop to show only those events that are of interest. By including only events that are of interest, you can analyze results more efficiently.

You apply filters to each session individually; so different sessions can have their own filter settings. When you change a session's filters, InSight Desktop immediately refreshes the display. When you exit InSight Desktop, all session filters are cleared and must be reapplied when you restart.

### Filter editors

InSight Desktop provides two ways to edit filters:

- **Filter Manager:** Maintains a set of saved filters that you can review and edit. You can also add new filters. You specify any of the saved filters for display on the Filters menu, where they are accessible for use in one or more sessions.
- **Filter Bar:** An editor that attaches to a given session, where you can enter one or more filter expressions on the fly. InSight Desktop discards filter bar expressions for all sessions when it exits.

### Quick filters

InSight Desktop also provides several preset context-sensitive [quick filters](#) that are available from the Transactions and Events editor panes.

## Filter Manager

The Filter Manager lets you perform the following tasks:

- Compose filter expressions with the expression builder.
- Use filter expressions to customize display of entries in the Events pane.
- Specify which filters appear in the Filters menu.

### Building filter expressions

The Filter Manager provides an Expression Builder that provides a built-in set of valid operands and operators that you can use to compose filter expressions. You can also enter expressions manually. In both cases, Expression Builder validates entries as you work and prevents you from setting invalid expressions.

#### To use Expression Builder:

1. Select a filter from the Filter Manager list, and click on the filter expression
2. Click on the ... control.
3. Choose the required operands, operators, and values. You can use logical operators such as && and || to specify multiple conditions, and parentheses ( ) to group expressions and set precedence.
4. Click OK

### Maintaining filters

In order to add a filter to the Filters menu, set the Menu checkbox. This makes the filter available to the current sessions.

You can also add, delete, and rename saved filters. In order to restore filters to their installation settings, click Reset.

### Setting filter color schemes

You can associate a color scheme with each filter. If an event evaluates to true for a given filter expression, InSight Desktop applies the filter's color scheme to that event. An event can be configured with a color scheme for two display levels:

- In the Map pane, the color used by the graphic representing the event type.
- In the Events pane, the foreground and background colors used by event type instances.

**NOTE:** Setting a color scheme on a filter expression does not specify whether to display events; it only determines how to display certain event types.

To set a filter color scheme:

1. In Filter Manager, click on the filter expression item.
2. Set the color of the Map pane graphic, and foreground and background colors of event instances, by clicking on each one's ... control
3. Click on the Color checkbox to determine whether to use this color scheme.
4. Set the color scheme's precedence level by assigning it a positive or negative integer. If an event evaluates to true for multiple filters, InSight Desktop uses the color scheme with the highest precedence.
5. To refresh the Map and Event panes with the new color scheme. click Reapply.

## Filter Bar

A session's filter bar provides the same level of functionality as the Filter Manager for building expressions. Any filter expression that appears in a session's filter bar is AND'd with the saved filter expressions that are already in effect for that session.

You can compose a filter bar expression in two ways:

- Enter the expression directly in the filter bar field, and press Return.
- Use the [Expression Builder](#) by clicking **Compose**

## Quick filters

InSight Desktop provides several filters that are available from the Transactions and Events editor panes. You access these filters by right clicking on an event or transaction and choosing a context menu option.

The filter options that are available depend on the transaction or event that you select. You can specify to hide all events/transactions of the selected type, or to show only that type. For example, if you select an event of type APITrace, the context menu displays two filter options:

- Hide type: APITrace
- Show only type: APITrace

Further, if you select an event such as a neighbor exchange that has a source and/or destination address, the context menu also contains these two filter options:

- Show only destination: *short-ID*
- Show only source: *short-ID*

In all cases, InSight Desktop enters the corresponding filter expression in the session's filter bar. For example, if you specify to show only route discovery transactions, this expression is set in the filter bar:

```
isType(Route)
```

**NOTE:** When you choose a quick filter, its expression overwrites any previous filter bar expressions.

## Customizing InSight Desktop

You can customize the look and feel of InSight Desktop to suit your work habits and preferences. Customization features also can help you work more effectively. The following sections show how to:

- [Create InSight adapter groups](#)
- [Customize editor panes](#)

### Creating InSight adapter groups

When newly installed, InSight Desktop shows all InSight adapters within a single default group. You can group adapters logically under folders that you create. For example, your application might have different types of sensor nodes, and various sink nodes for each type. In that case, it makes sense to group the adapters of similar nodes under a folder that you name. This can help you remember which applications are running on those nodes.

You can also use custom groups to issue commands and upload applications to multiple adapters and their nodes. Any command to the group is broadcast to all adapters within it. Similarly, an application that you upload to a group is uploaded to all its adapters.

#### Creating a custom group

To create a custom group:

1. From the Adapters toolbar, click **Add Group**  
  
InSight Desktop creates a new folder New Group.
2. If desired, rename the New Group folder:
  - Select the folder name.
  - Type the folder's new name, then press Enter.
3. Click on a node to be moved and drag it to the new folder. For multiple selections, use Shift-Click and Ctrl-Click for contiguous and non-contiguous selections, respectively.

#### Removing a group:

When you have no further use for a group, you can remove it as follows:

1. In the Adapters view, right-click on the folder to remove.
2. From the context menu, choose **Delete**

InSight Desktop removes the group folder and moves its adapters to the default group.

### Customizing editor panes

InSight Desktop provides a number of customization options that let you change the appearance of the editor's [map](#), [transaction](#), and [event](#) panes:

#### Map pane

You can move node icons within the map display. This has no effect on network functionality; however, it can help to highlight certain node interactions and relationships. When you move node icons in a session, InSight Desktop asks whether to save those changes before you close the session.

The following Edit menu options let you customize the map pane's appearance and behavior:

- **Show Connectivity** shows the routes that nodes use to communicate with each other.
- **Show LQI** toggles display of link quality data that pertains to the quality of connection between nodes.
- **Node identifier toggle options** help identify nodes:
  - **Show Short ID** toggles display of the node's 16-bit address that is unique within the personal area network (PAN)
  - **Show EUI64** toggles display of the node's unique 64-bit IEEE address
  - **Show PAN ID** toggles display of the PAN identifier of the node's network. This label can be useful when the map displays multiple networks.
  - **Show Node Label** displays the custom label that you create for map display only.
- **Zoom Map In** and **Zoom Map Out** enlarge and shrink the space that the map uses to display nodes. Zoom options have no effect on the size of node icons.
- **Load Background Image** lets you display a background image in the map pane.

#### Node display options

When you select a node icon in the Map editor, the following display options are available from its context menu:

- **Assign EUI64** lets you assign a EUI64 to a node. InSight Desktop obtains a node's EUI64 only when that node associates with a network. If the node already belongs to a network when a session begins, its EUI64 is unknown to InSight Desktop. This option lets you display a known EUI64 for a node; the node's actual EUI64 is unaffected by this label.

If InSight Desktop obtains a node's EUI64, this option is unavailable.

- **Label** By default, the map pane labels each node that is undergoing capture with its adapter (device) name. This option lets you customize the node's label with any string up to 25 characters long. This string appears in brackets after the node's device name.

You can also make the labels time-dependent, by entering a start time. This lets you supply multiple names for the same node. This can be useful while debugging applications, by indicating the node's current state.

- **Icon** provides a menu of [defined icons](#) to represent the selected node.
- **More Icons** invokes the [Node Icons dialog](#).
- **Color** provides a palette of available colors. You can apply one of these to the node icon.

#### Transaction and event panes

The following Edit menu options let you customize the appearance and behavior of the transaction and event panes:

- **Simultaneous Events** modifies the map pane to display all events that occurred at the same time as the transaction or event that is currently selected.
- **Apply Row Coloring** toggles **filter** color definitions on and off.

### Bookmarks

You can set a bookmark on any event as follows:

1. Right-click on the event.
2. From the context menu, choose **Add bookmark**
3. In the Add Bookmark dialog, supply a name and time for the bookmark:
  - The bookmark name can be any string.
  - The bookmark's time is initially set just before the selected event. You can change this to any time that precedes or follows existing events or bookmarks.

## Reconfiguring the Work Area

You can rearrange InSight Desktop's physical configuration to suit your work habits and preferences. For example, you can reposition the Adapters view, or resize editor panes. You can also restore the startup configuration by choosing the menu bar option

**Window | Reset perspective.**

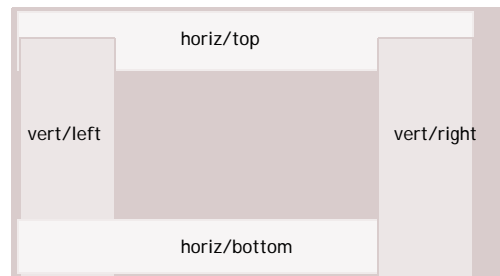
### Manipulating views

The InSight Desktop work environment has two views: Adapters and Filter Manager. When you first open InSight Desktop, it positions these views as follows:

- Adapters view is on the left
- Filter Manager is hidden. When initially invoked, InSight Desktop places it on the bottom.

You can perform the following actions with views:

You can reposition a view anywhere on the working area's perimeter that is not occupied by another view. Four positions are possible, as shown in the following figure:



To reposition a view, click on its title bar and drag to the desired position.

### Resizing and hiding views

Each view has the following controls:

- **Maximize** expands the view to encompass the entire working area.
- **Minimize** shrinks the view to a narrow strip.
- **Close** removes the view from the working area. You can restore a closed view by selecting it from the **Window | Show view** menu.
- **Restore** resets the view to its dimensions before it was minimized/maximized.

You can manually resize a view by dragging its inside border in and out.

### Using fast views

You can designate the Adapters and Filter Manager views as fast views. When you do so, InSight Desktop anchors the view to a fast view icon, which can be toggled to display or minimize the associated view.

**NOTE:** While the Adapters and Filter Manager views can both be designated as fast views, only one can be active as a fast view at any given time.

To create a fast view:

1. Right click on the view's title bar.
2. From the context menu, choose Fast View. InSight Desktop minimizes the view and associates it with a fast view icon that displays on the Fast View bar.

Alternatively, drag the view to the Fast View bar.

When you restore a fast view, it restores its previous orientation—vertical or horizontal. To change the current orientation, right click on the view's title bar and choose an Orientation option.

#### Using tear-off views

Any view can be removed from the main window so it floats freely.

**NOTE:** A view can be either a tear-off or a fast view, but not both.

To create a tear-off view:

1. Right click on the view's title bar.
2. From the context menu, choose Detach. InSight Desktop detaches the view from the main window.

## Modifying editor panes

The relative positions of editor panes are fixed. However, you can change their dimensions in two ways:

- Resize an editor pane by dragging an inside border.
- Click the editor pane's resize control. Depending on the pane's current state, this control toggles between Maximize and Restore.

## Setting Preferences

You can set general preferences for InSight Desktop that apply to all capture sessions. InSight Desktop saves these preferences and uses them each time it restarts.

### Application Upload

The Ember installation sets the Windows registry with default paths to the application loader and bootloader image, which InSight Desktop uses when it uploads applications to EM2xx nodes. Use this Preferences dialog to specify different locations:

**Application loader path** specifies the loader utility that is used to upload bootloader or application images to EM2xx nodes. Set this field by browsing for another application loader.

**Bootloader image path** specifies the bootloader application that is uploaded to an EM2xx node when you upload an application image. The bootloader application is uploaded depending on the status of Always Upload Bootloader Image:

- Always Upload Bootloader Image is checked: the node is refreshed with a new bootloader image whenever you upload an application.
- Always Upload Bootloader Image is unchecked: the bootloader image is uploaded only if no bootloader image is present on the node.

You can upload the installed bootloader image, or you can browse for a different one.

### Decoding

**Decryption key:** Key used to decrypt security-enabled packets.

**Security level:** The security level set for the MAC and network layers:

- 0x00: No security.
- 0x05: Payload is encrypted and a 4-byte MIC is used for authentication.
- 0x85: Payload is encrypted and the MAC header is always authenticated. This setting is not defined by the ZigBee standard.

**Packet decoder mode:** Specifies the version of the EmberZNet or Embernet stack that is used. Auto-detect can detect most stack versions except Embernet 3.3.

**Ignore security flag:** If set processes any packets that have their security flag turned on, whether the contents are encrypted or not.

**Custom decoders:** specifies which custom decoders to use. If enabled, custom decoders provide an extra layer of decoding for application-level data.

### Adapter Discovery

InSight Desktop searches for all InSight adapters to display according to the settings in the Discovery Preferences dialog, accessed from **File | Preferences | Discovery**.

InSight Desktop, by default, scans the local subnet for adapters. However, you can configure InSight Desktop to find adapters on other subnets with this format:

*subnet-ip-address/mask-address*

For example: 192.100.5.0/255.255.255.0

### File

Check **Monitor files for appending after opening** if you wish to enable InSight Desktop to detect new packet data appended by an external program to an open session file, and read it in for display.

### Help

Specify whether to open up help in an Eclipse window or an external browser.

### Licensing

In the Licensing dialog, you can obtain information about your InSight Desktop license; and you can reset your license key. License keys are provided by [Ember customer support](#).

### Node Icons

The Node Icons dialog displays all icons that are available for customizing [display of nodes in the map pane](#). InSight Desktop provides predefined several icons. You can also add icons of your own.

### Stream

You can configure how InSight Desktop handles incoming data for capture sessions with these options:

**Maximum number of cached events:** specifies how many events can be displayed in a live session. When you exceed this limit, InSight Desktop removes the earliest events from the cache and no longer displays them.

**Sorting and duplicate match window:** Specifies in microseconds a time span in which duplicate packets can be detected. If identical packets arrive within the specified time span, InSight Desktop detects the duplication and allows only one to display.

This setting also determines how events are sorted. In general, events are reported in chronological order. In the event that packets are received out of order, InSight Desktop uses this setting as follows:

- Events that arrive within the specified time span are sorted chronologically.
- Events that arrive after the specified time span display out of chronological order.