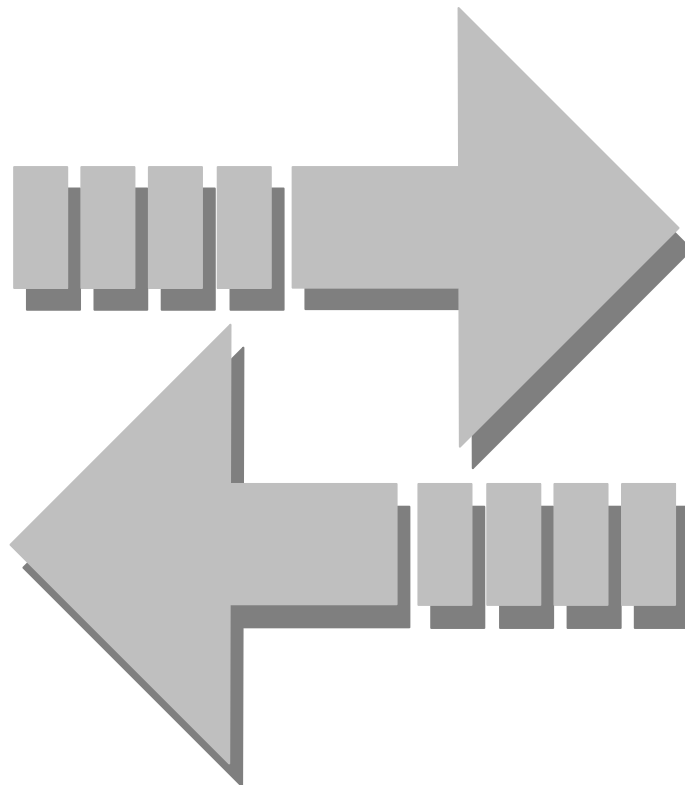




# External Input Integrator

Application User Guide



## External Input Integrator

This document covers use of the Mecmesin External Input Integrator application for handling external RS232 COM input devices.

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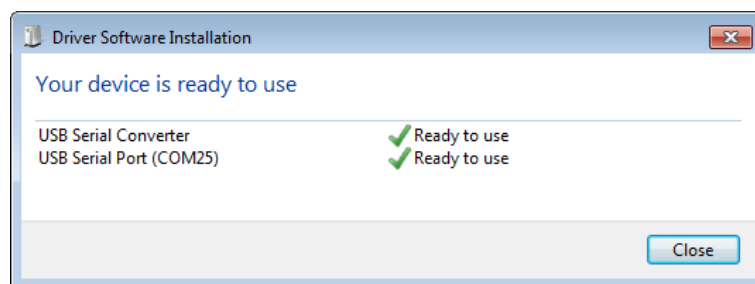
# 1. Installation

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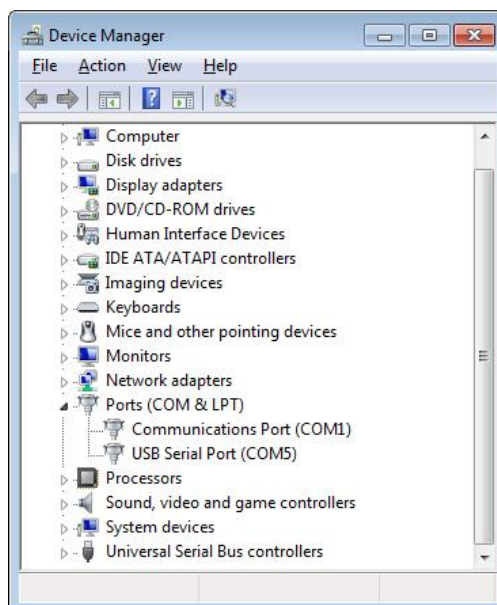
1. The Integrator application is installed with Emperor™ 1.19 (or later versions).
2. Attach the UTC\_USB (with sensor/device attached) to USB port on the PC.

Drivers will be installed automatically and the following window may appear, informing you which COM port the device is attached to.

**Please note the COM port assigned**, as this will be required for setting up the device as part of the Integrator application.



If this window does not appear, open Windows Control Panel, Device manager, to discover on which COM port the device has been set up.



The examples used in this guide are of thermocouple devices, but the process is the same for any RS232 COM device required to be attached to the I/O port of a Mecmesin test stand.

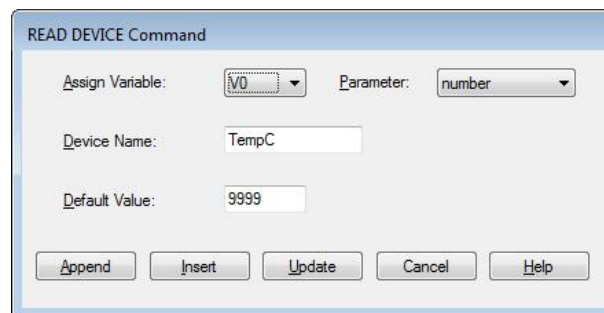
## 2. 'READ DEVICE' Program Command in Emperor

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To accommodate getting readings from external devices via the new Integrator application, an additional program command 'READ DEVICE' has been introduced to the Emperor™ software.

### 2.1 Using READ DEVICE

This command, when added to the Emperor program test sequence, will take a reading from an external device connected to the Integrator application and store it in a variable as either a number or a string (ASCII).



The READ DEVICE command can be used many times throughout the program to take either several readings from the same devices at different stages of the test or from different devices. Remember to use a different variable for each reading if each reading is to be used in the results display or calculations section of the test program.

**Assign Variable:** Select the variable to assign the reading from the device (V0 - V99).

**Parameter:** Select what type of parameter the reading from the device will be stored as, in the variable (Number or String).

**Device Name:** Enter the name of the device from which the reading is to be taken. This must be exactly the same name as set up for the device name in the Integrator application.

**Default Value:** Enter the value to be stored in the variable as a non-response indicator, if the device has failed to return a reading to the Emperor software.

## 3. Getting Started: Obtaining Temperature Readings in Emperor

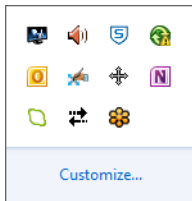
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The Integrator application itself will have been installed with Emperor™. If you use it regularly, add a shortcut to your Windows desktop.

### 3.1 Start Integrator

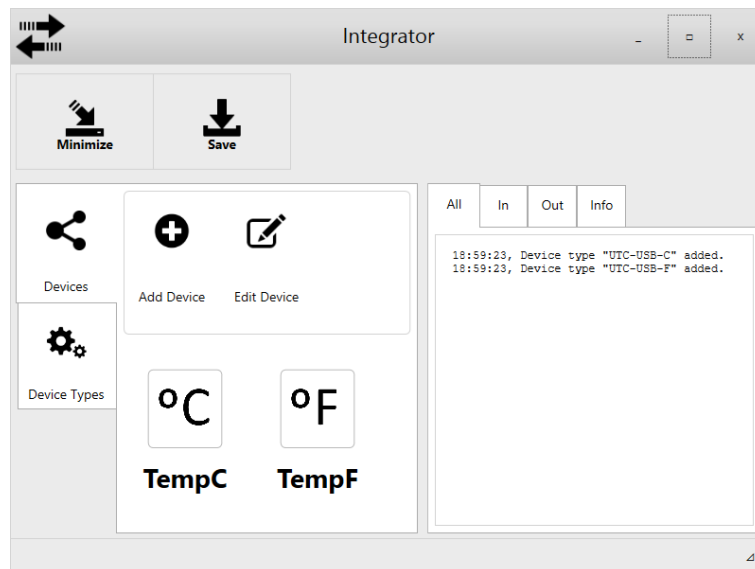


Click the Integrator application via desktop shortcut (or Start Menu).



Click on the Integrator icon in the taskbar notification area.

The following window will appear:



Two devices for reading temperature have already been set up in this example, to read temperature from a UTC-USB thermocouple device, either in °C (TempC) or °F (TempF).


These devices need to be assigned the correct COM port that has been selected for UTC-USB device on your system (as noted in section 1, above).

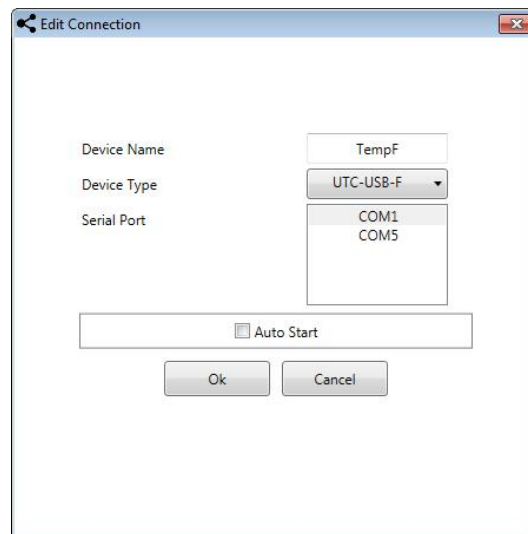
## 3.2 Edit devices

 Press the Edit Device button. This will remain highlighted .

 will appear on each device icon.

Click the cross ONLY to delete a device setup altogether.

 Click the device icon (TempF) to edit the connection for this device.



Select the correct **Serial Port** (COM) that the UTC-USB device is connected to.

Select **Auto Start** if this is the device you want to automatically connect *every time* the integrator application is started.

Click OK to store these settings to memory.

 Repeat the above for the 'TempC' device, or for any other RS232 device attached.

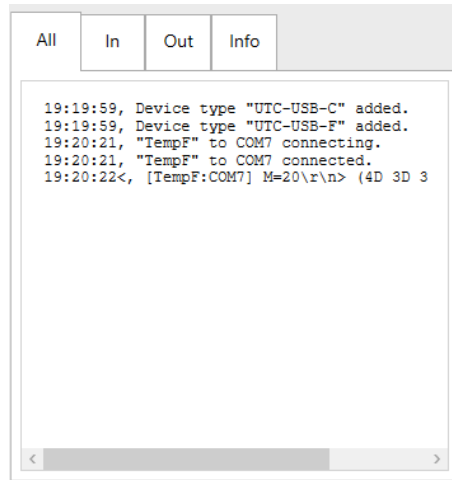
 Before closing the connections editor, save the settings.

## 3.3 Connect devices

 Press the 'TempF' device button to connect the Integrator application to this device.



The Integrator application will now try connect to this device and once connected, a connected message will appear in the communications log window:



The Integrator application is now able to take readings from the UTC-USB device in °F.



Press Minimize to run Integrator as a background application.

### 3.4 Testing the device in Emperor

- Start Emperor and log on, in Programmed Testing mode. Make sure your test stand is connected.
- Load the Library Program named 'Read Temperature (°F).tem' (or °C, as appropriate).
- Press the Start button.
- The test program will now run a simple program taking a start and finish temperature during the test.
- When the test is completed, the results will be displayed showing the temperature readings taken:

Results	Sample 1	Average	Std. Dev.
Included	<input checked="" type="checkbox"/>		
Start Temperature (°F)	76.00	76.00	N/A
Finish Temperature (°F)	76.00	76.00	N/A

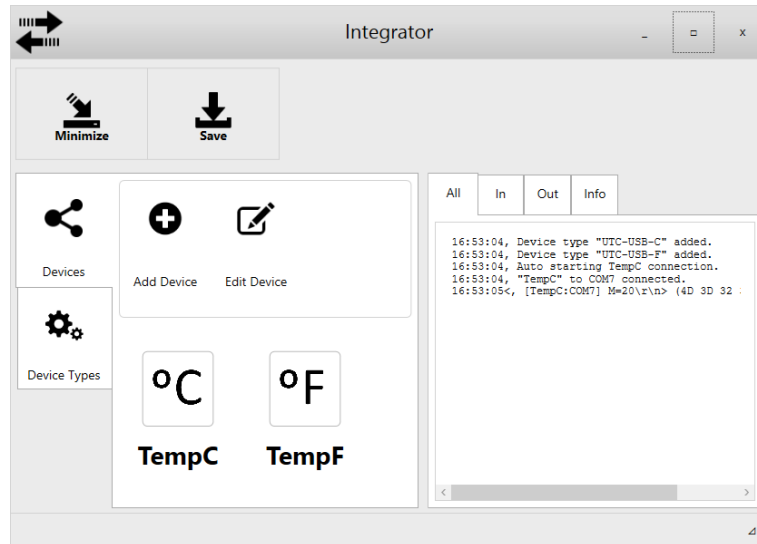
To see how the READ DEVICE command in Emperor is used, and the readings displayed in the results window, open *Test > Program* and *Test > Calculation* for 'Read Temperature (°F).tem' or 'Read Temperature (°C).tem'.

## 4. Integrator Application Interface

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Open Integrator (from the desktop) to see the application control:



Minimizes the application



Saves your settings



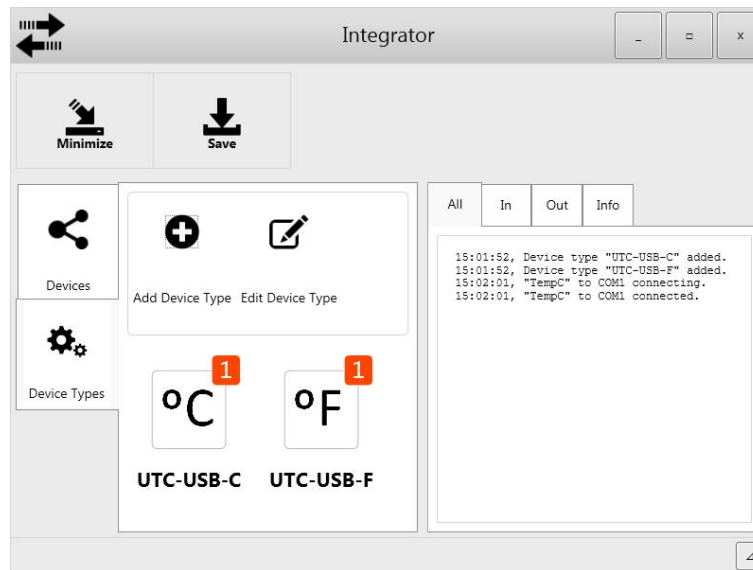
Use this tab to add or edit device types




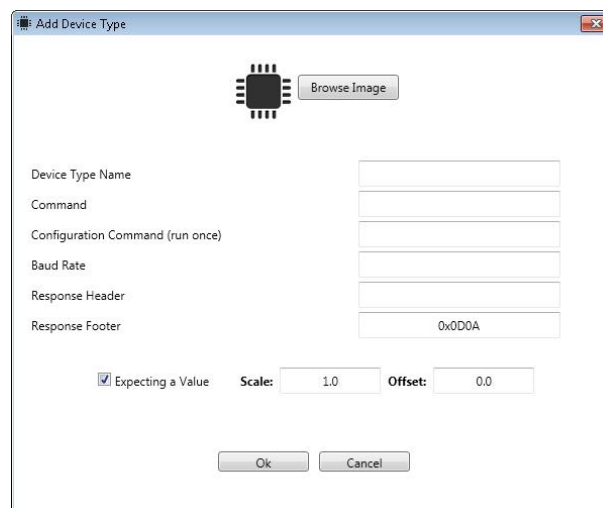
Use this tab to add or edit specific devices

### 4.1 Defining device types


Two devices are pre-defined. Other device types can be set up as required.




 Click to add a new device type:



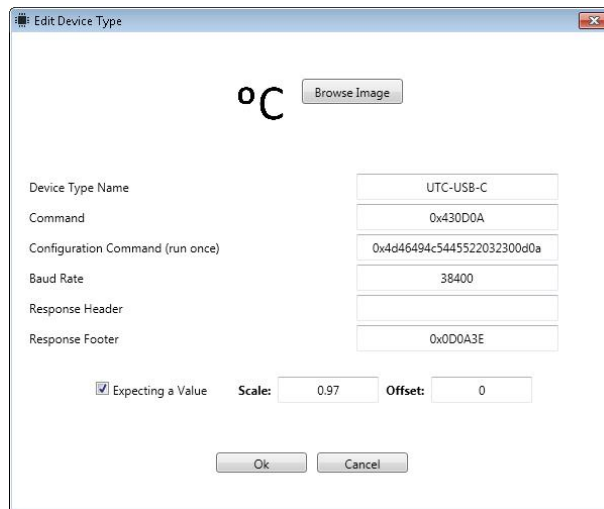
To complete the definitions, see the example in 'Edit' below.

 Clicking 'Edit Device Type' enables/disables editing of a device type. Once the edit mode is enabled, click in the device type that requires editing:



 will **delete** the device type.

The number in the top corner of the device icon indicates how many devices are set up for this device type in the Integrator application.



- Image**                                      Used for ease of recognition.
- Browse Image**                            Click to select an image to display for this device type.
- Device Type Name**                      Enter a unique name for this device type.
- Command**                                Hexadecimal string, of the command to send to this device type to get required data.
  
- Example shown:*  
0x (hex flag) 43 (hex for character C) 0D (hex for carriage return) 0A (hex for line feed)
- Configuration command**              Hexadecimal string, of the command to send to this device type to configure the device setting, when a connection is started.
- Baud Rate**                                The correct COM Port baud rate to communicate with this device type.
- Response Header**                        Hexadecimal string to indicate the start of the response that will be received from this device type. This will be removed to obtain the data packet.
- Response Footer**                        Hexadecimal string to indicate the end of the response that will be received from this device type. This will be removed to obtain the data packet.

*Example shown:*  
0x (hex flag) 0D (hex for carriage return) 0A (hex for line feed) 3E (hex for character >)

- Expecting a Value**                      Check this box if the command setup for this device type will respond with a value. (Checked as default.)
- Scale**                                        Scale is a slope/gradient correction applied to the value received before transmission to the Emperor Software. See this equation:

$$\text{Corrected Value} = \text{Value Received} * [\text{Scale Value}] + [\text{Offset Value}]$$

## Offset

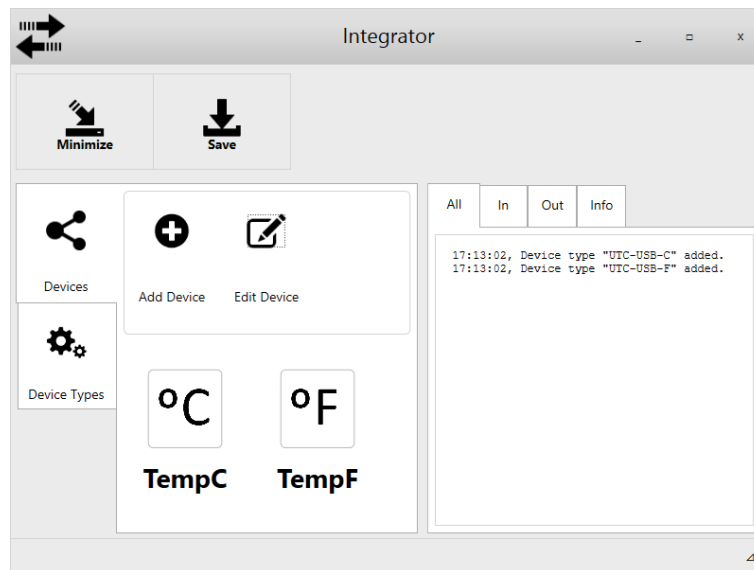
This is an offset correction applied to the value received, before transmission to the Emperor Software. See equation above.

Currently only RS232 COM devices are supported. (This includes USB devices that can be setup with virtual COM ports.)

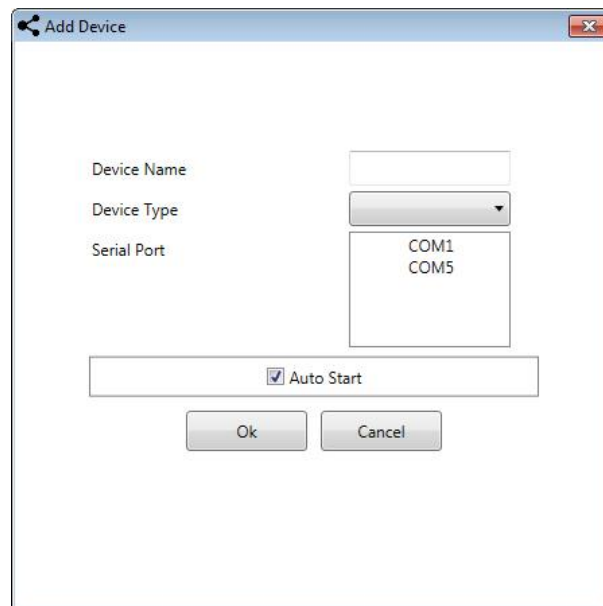
## 4.2 Defining device connections



Click to add or edit a device with which Integrator can communicate:



Click to add a new device:



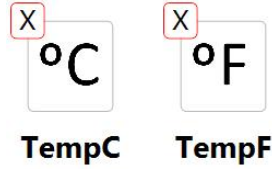
To complete the definitions, see the example in 'Edit' below.



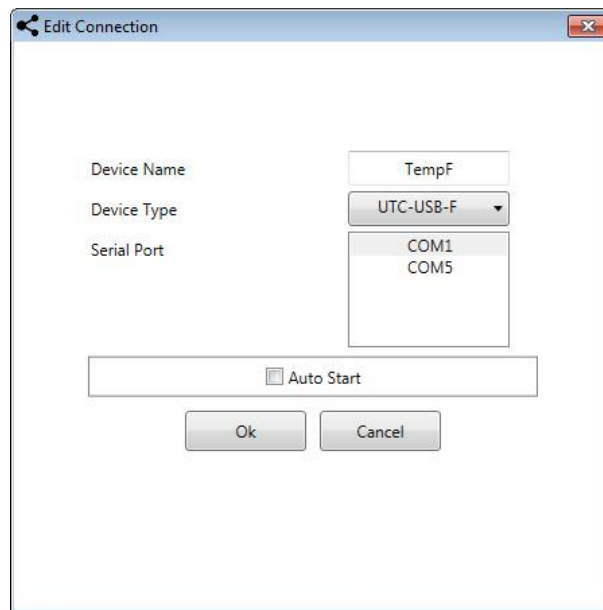
Clicking 'Edit Device Type' enables/disables editing of an individual device.



Once the edit mode is enabled: , click in the device definition that requires editing:



will delete the device.



- Device Name**                      A unique name for device. This name will be used by Emperor to identify and acquire data from this device.
- Device Type**                      Select the correct type for this device from the list.
- Serial Port**                        COM Port to communicate with this device.
- Auto Start**                        Check this if you want the device to connect automatically when the Integrator application is started.



Click 'Edit' again to exit editing mode.

### 4.3 Connecting and disconnecting devices

Once a device has been set up as above, clicking on the device icon will enable communication with that device, and display a tick on the icon to indicate that the device is enabled. Pressing the device icon again will disable the device:




### 4.4 Saving settings

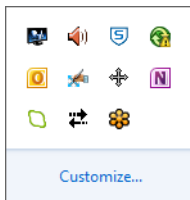


After any changes make sure that they are saved by pressing the Save button.

### 4.5 Running Integrator as a background application



or  will minimize the application window to run Integrator in the background. It will be visible in the task bar notification area as a background running application and so that Emperor can still communicate with it:



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