

Configuring I/O Modules in a Local Chassis

To transfer data to and from field devices, they must be connected to an I/O module either digital or analog. These modules are placed in the chassis slots in any order. All modules within a chassis, can be removed and inserted under power (**RIUP**). Caution must still be exercised.

There are two main types of I/O module.

- **Digital:** Information represented by a 1 or 0.
- **Analog:** Numeric values that representing variable quantities such as process values. This can be temperature, flow, level etc.

Digital Modules

The options available for Digital I/O are as follows.

- 8, 16, and 32 point choices
- Electronic keying. This prevents the wrong module being placed in the wrong slot
- Isolated, non -isolated, and diagnostic choices:
 - Module-level fault reporting and field-side diagnostics
- Electronic fusing.

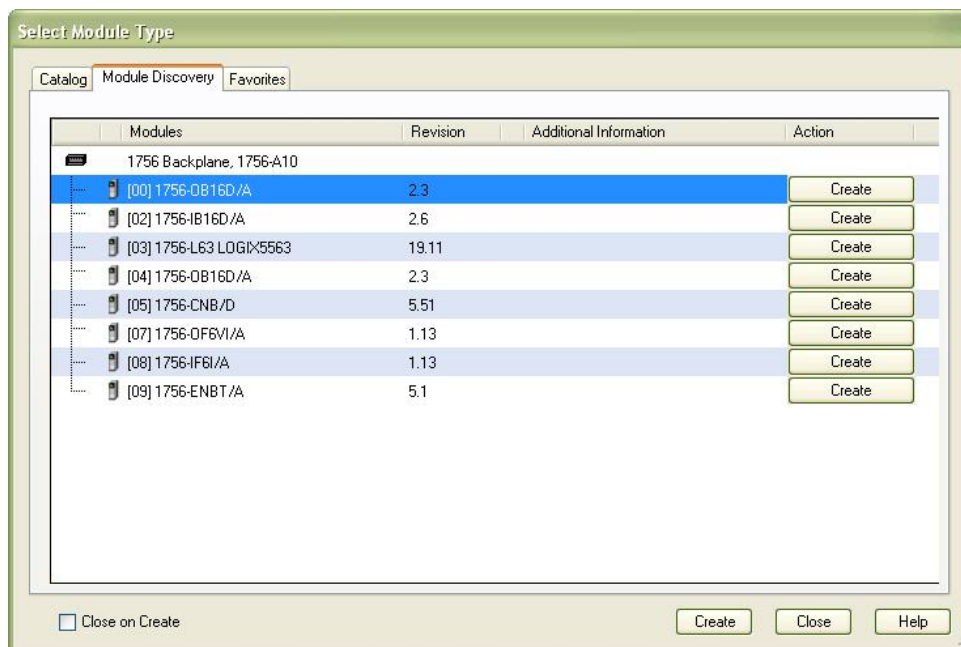
All the above options are not available on every module. It depends on the type selected.

Analog Modules

Analog 1756-I/O modules convert analog to digital values using an A/D conversion for the inputs and convert digital to analog signals for outputs using a D/A conversion. They have the following properties:

- **RIUP**
- You can scale each channel to engineering units if floating point comms. format is used. This will give fractional values.
- 32-bit floating or 16-bit input and 13-16 bit output integer data format, depending on module
- **Alarming.** Each channel can have process alarms configured on the input modules.
- **Output Limits.** On an output module, each channel can have the output limited if desired. For example, if a control valve needs to be limited to 50% opening, the output can be clamped at 50%.

- Rolling time stamp of data.
- Diagnostic choices
- When a project is created, it is necessary to configure the modules required in the project. It does not automatically find them. This is because of the multi controller system where more than one controller may need to use some of the modules in the chassis or even share in the case of input modules.
- The following has to be configured when creating a module.
- **Slot Number.** The location of the module in the chassis
- **Module Type.** This is digital or analog, input or output.
- **Revision.** This is extremely important with digital modules. If the incorrect major revision is stated, a module error will be shown and the module will not function.
- **Name,** Give the module a realistic name.
- **Electronic Keying.** This can be **Exact Match.** This means all aspects of the module configured, must match the module exactly, including minor revision. No differences allowed.
- **Compatible Match.** The configuration must be the same as the module but the Minor Revision may be higher and it will work.
- **Disable Keying.** If this is used, it just checks that the module is the same type and nothing else. It is not really recommended that this is used except in unusual circumstances.
- **Module Discovery**
- There is a feature within logix5000 called **Module Discovery.** If you are on line to the controller, all modules in the chassis are listed as shown below. A module can then be selected and configured. This way, all module parameters will be correct as they have been taken direct from the module.

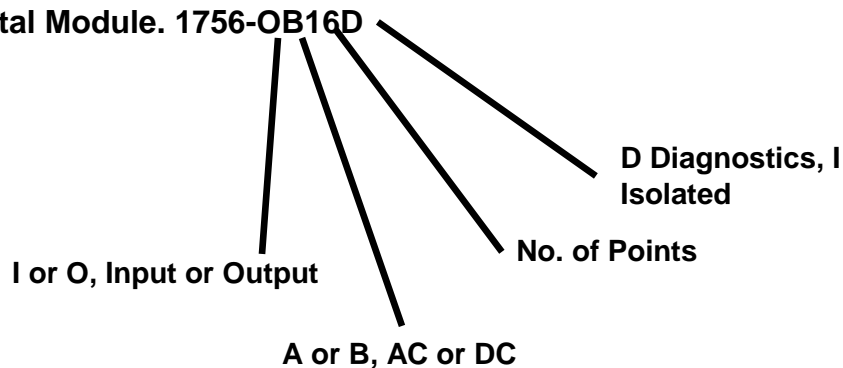


Illustrated below is the way that module configuration will look in a project



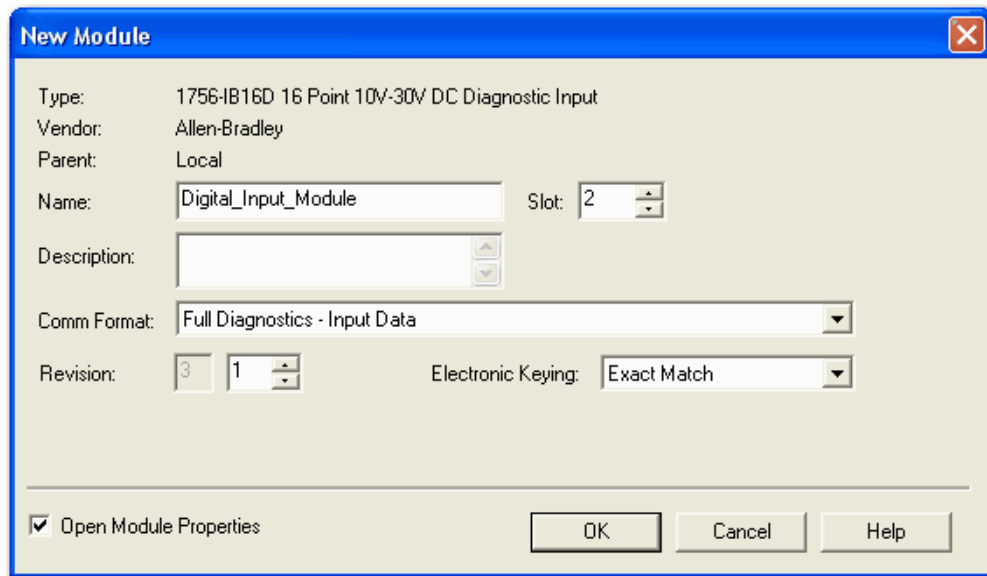
All Modules have a model number.

Digital Module. 1756-OB16D



All controllogix modules have a prefix 1756.

There are some illustrations below showing a selection of configuration windows on specific modules.



New Module

Type: 1756-IB16D 16 Point 10V-30V DC Diagnostic Input
 Vendor: Allen-Bradley
 Parent: Local
 Name: Digital_Input_Module Slot: 2
 Description:
 Comm Format: Full Diagnostics - Input Data
 Revision: 3 1 Electronic Keying: Exact Match

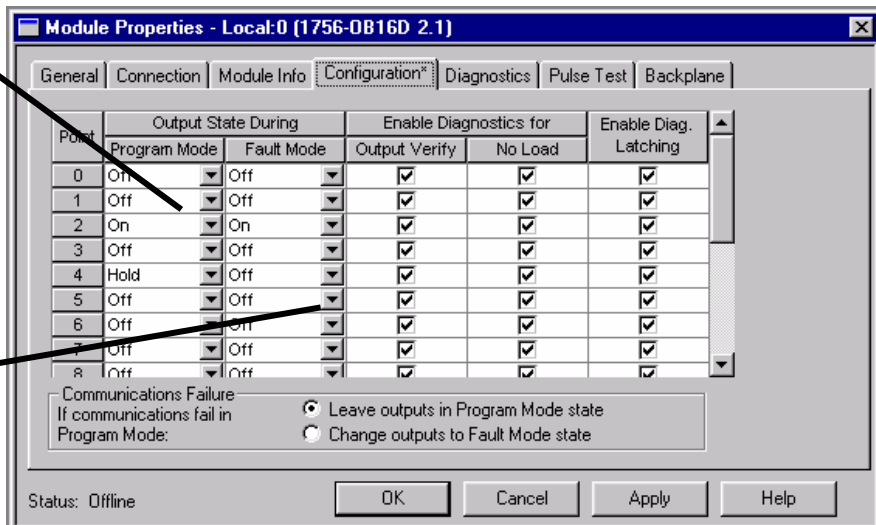
☒ Open Module Properties

OK Cancel Help

The above illustration shows the Name, Slot number, Comms format and Electronic keying option, in this case, Exact Match.

Output States During Program Mode

Output States During Fault Mode



Module Properties - Local:0 (1756-OB16D 2.1)

General Connection Module Info **Configuration*** Diagnostics Pulse Test Backplane

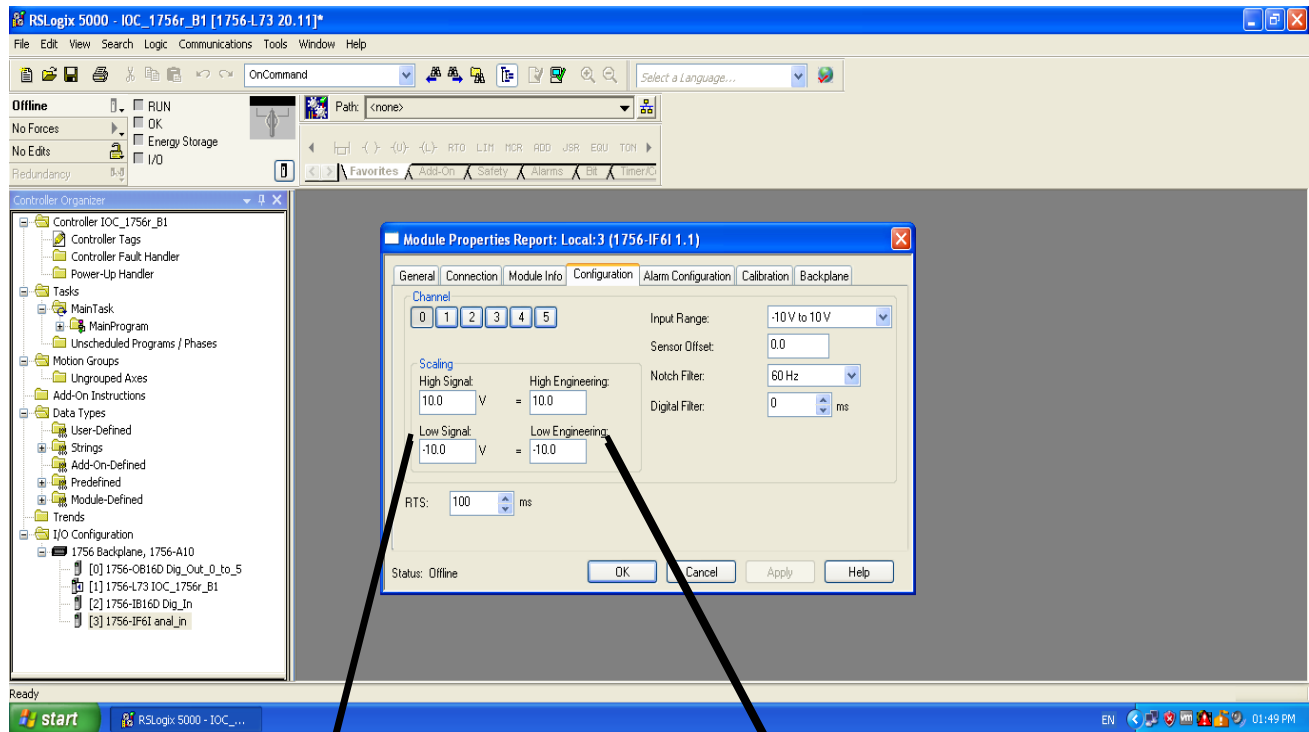
| Point | Output State During | | Enable Diagnostics for | | Enable Diag. Latching |
|-------|---------------------|------------|-------------------------------------|-------------------------------------|-------------------------------------|
| | Program Mode | Fault Mode | Output Verify | No Load | |
| 0 | On | Off | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 1 | Off | Off | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2 | On | On | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3 | Off | Off | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 4 | Hold | Off | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5 | Off | Off | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 6 | Off | Off | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 7 | Off | Off | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 8 | Off | Off | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |

Communications Failure
 If communications fail in Program Mode:
☒ Leave outputs in Program Mode state
☐ Change outputs to Fault Mode state

Status: Offline

OK Cancel Apply Help

The above illustration is showing the configuration window for a digital output window. The output states for program and fault mode can be independently set for each point. The diagnostics can also be enabled for each point.



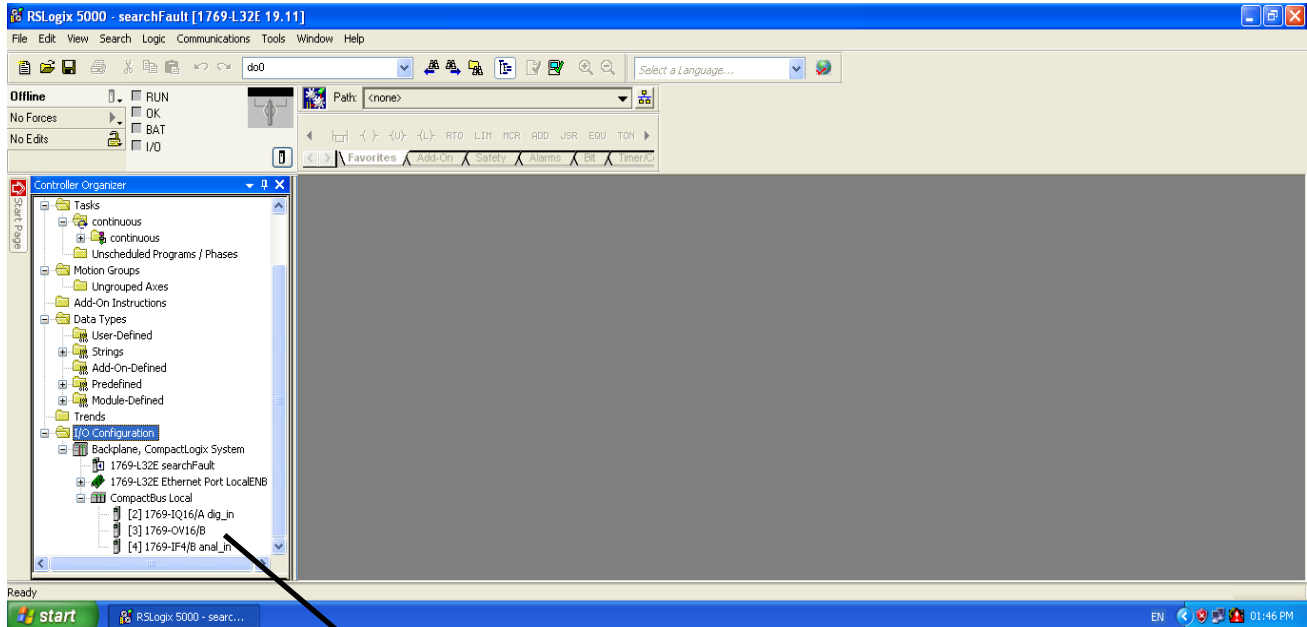
**Minimum and Maximum
signal**

Engineering Units

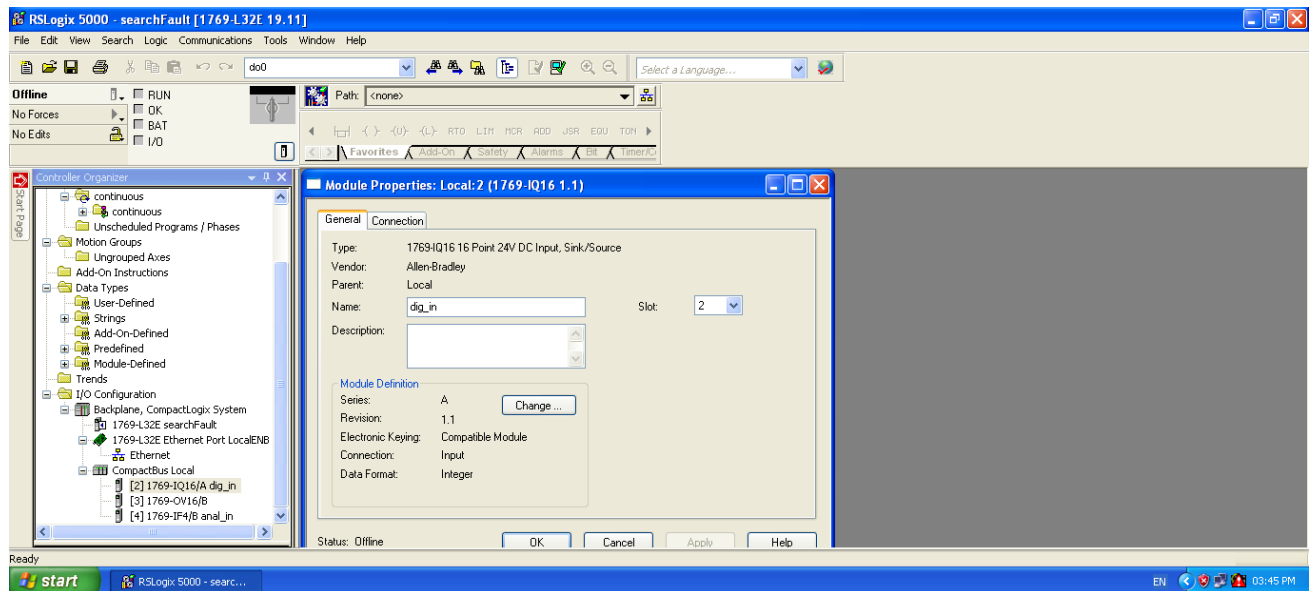
The above illustration shows the Properties, Configuration page for an Analog In module. Each channel of the module can be independently configured for the minimum and maximum signals and engineering units. This is very useful if you are using direct reference tagging from the PLC to an HMI. Process alarms can also be configured in the same manner.

Module Configuration using CompactLogix

I/O Modules are configured in a similar fashion in compactlogix as controllogix. There are no slots as such but module positions. When a module needs to be configured, they are configured at the controlbus in the I/O configuration as shown below.

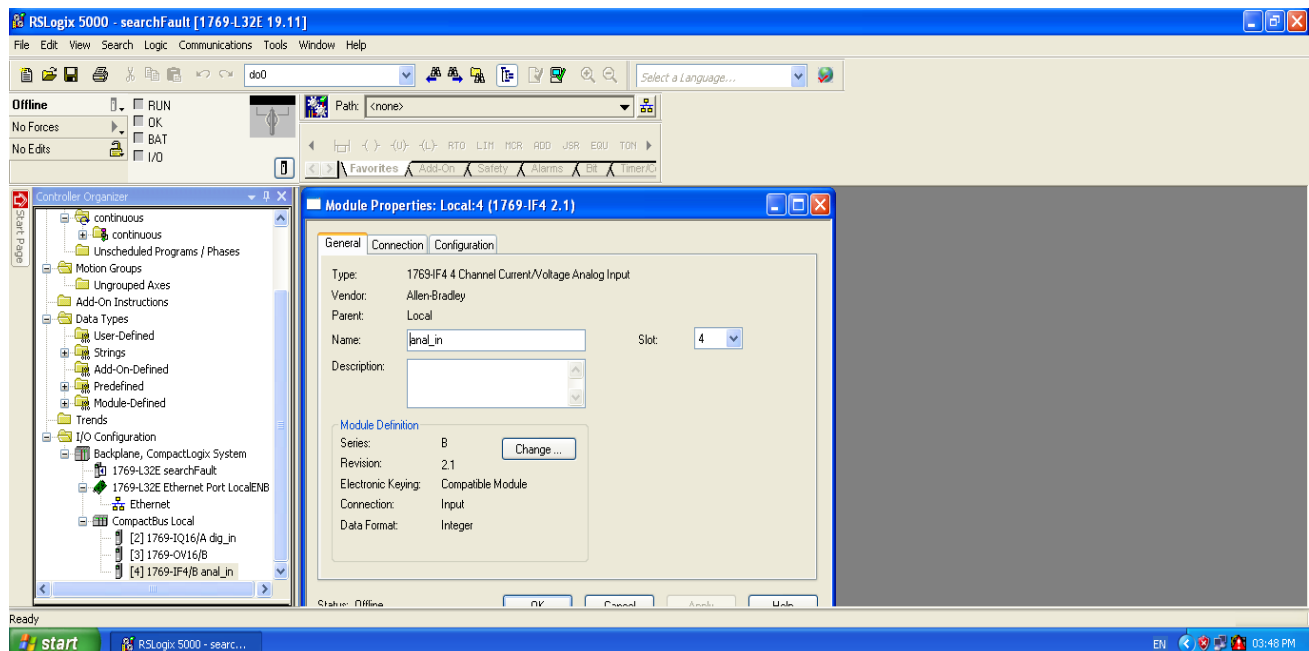


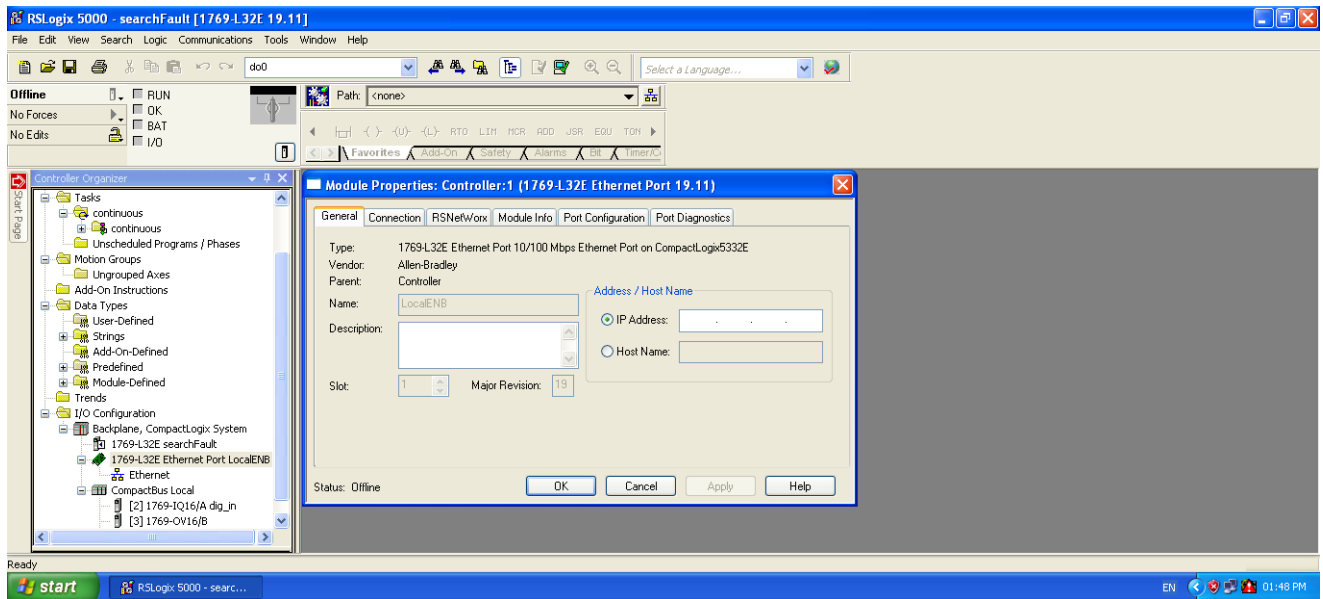
Configured Modules



The illustration above, shows the properties screen of a digital module. There are no diagnostics in this instance.

Shown below is the properties page of an analog input module. There is no scaling involved. The data is an integer comms format.





The illustration above shows the configuration screen of the controller for configuring the Ethernet Communication. The IP address is set here. This must be within the correct IP range and class of the network being used.