.NET OptoMMP SDK for SNAP PAC

Introduction

The .NET OptoMMP Software Development Kit (SDK) for SNAP PAC provides a simple, easy-to-use interface for a developer to quickly create an Ethernet I/O-based application for Opto 22 products that use the OptoMMP protocol. This SDK encapsulates the OptoMMP messaging protocol used by our Ethernet-based brains for reading or writing I/O data.

For more information about OptoMMP and the complete memory map, see Opto 22 form 1465, the *OptoMMP Protocol Guide*. The guide is available on our website, www.opto22.com.

The SDK supports Microsoft's .NET frameworks 3.5 through 4.5, Visual Studio 2005-2013, and both the 32- and 64-bit editions of Windows® 10 Professional, Windows 8.1 Professional, and Windows 7 Professional, as well as Windows Server® 2008 R2. The SDK is available as a 100% managed DLL.

System Requirements

- Visual Studio 2005 through 2013 (Express or higher versions)
- One of the following operating systems:
    - Windows 10 Professional (32- or 64-bit)
    - Windows 8.1 Professional (32- or 64-bit)
    - Windows 7 Professional SP1 (32- or 64-bit)
    - Windows Server 2008 R2
- x86 or AMD64 processors, 1.5 GHz or higher.
- Ethernet interface (wired or wireless).
- For SNAP PAC SB-series I/O units, serial communication network

Adding the SDK to your Project

The SDK must be added as a resource to your Visual Studio project. It may be added to a C#, Visual Basic, or a CLR-enabled C++ project (Visual Studio 2005 and higher).

To add the SDK, follow these instructions:

1. In your Visual Studio Project, from the Project menu, choose Add Existing Reference.
2. Navigate to the folder with the OptoMMP3.dll.
3. Select the OptoMMP3.dll.

4. In your project files, choose one of the following:

  a. For Visual Basic, add an Imports (namespace) into your code file. For example: `Imports Opto22.OptoMMP3`

  b. For Visual C#, add a Using (namespace) into your code file. For example: `using Opto22.OptoMMP3`

  c. For Visual C++, add a Using namespace (namespace) in the beginning of your code file.
  For example: `using namespace Opto22::OptoMMP3;`

Make sure that the OptoMMP3.dll is in the same directory where the final executable is located.

To check whether the reference is included, open your project's Properties. Click on the references tab. You should see the OptoMMP3.dll listed as a reference.

Accessing Assembly Documentation

Assembly documentation is provided in an html format.

1. Navigate to the folder `SDK Documentation`

2. Open the html folder and open `index.html`

  Your default web browser will show the assemblies within the SDK.

Introduction to Assemblies

Namespace Opto22.OptoMMP3

This assembly serves as the OptoMMP2 interface. Use this assembly to configure, read, and write to I/O points of SNAP PAC R-series controllers and SNAP PAC EB-series Ethernet brains. (For help in understanding the architecture of the OptoMMP implementation, see the *OptoMMP Protocol Guide*.)

Namespace Opto22.MMPStreamsHelper

If you are using a streaming function, you can use either of two methods. Both use the **OptoMMPStream assembly**. See "Streaming Data" in Chapter 2 of the *OptoMMP Protocol Guide* for more information, and see the Memory Map Appendix in the same guide for all memory map areas and addresses.

- **Traditional OptoMMP streaming** from the Streaming area of the memory map. For more information see the section "Streaming Data" in the *OptoMMP Protocol Guide.* The Streaming area of the memory map is limited to a maximum of 64 points of I/O on a full rack, with all I/O modules having 4 points or less.

This functionality started with the SNAP-B3000-ENET brain (our earliest Ethernet-based brain, first released in 1998) and can still be used in the newest SNAP PAC brains, if desired. However, newer brains can support I/O modules with up to 32 points each and a full rack of 512 points, and this traditional streaming is not capable of handling the expanded I/O information.

- **New Custom areas** in the memory map now allow you to define the data you want in a stream, essentially pulling separated addresses in the memory map into one accessible location for streaming. To use this method requires three steps:

    a. Set up the data you need by writing to the Custom Configuration area of the memory map. See the example Custom Data Stream Demo in the SDK for help with this step.

    b. Put together the streaming packet using the format described in "Custom Streaming" in Chapter 2 of the *OptoMMP Protocol Guide.*

    c. Read and write to the Custom Data Access area of the memory map. (See the Memory Map Appendix for these addresses.)

The OptoMMP3 assembly contains methods to configure and verify either streaming method.

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