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Industrial Control Design AS



SimpleNMEA v1.2

Programmers Manual

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1. Introduction

1.1. About

This document describes how to install the SimpleNMEA component. See the following section for an overview of the component. Details regarding configuration and setup is located in the User Manual.

1.2. Overview

The SimpleNMEA component is designed to accept `CM_TEXTSTRING` messages containing (assumed NMEA) strings as input. These strings are matched against strings set up in the xml file. If a match is found, the string is checksummed. This checksum is compared against the checksum embedded in the string. If the checksum is correct, signals are updated from data in the string according to specifications in the XML file.

The SimpleNMEA component can also send NMEA strings as `CM_TEXTSTRING` messages to other CDPComponents (or CDPOjects). Signals are put into the string per specification in the component xml, the string is checksummed and then sent to the component specified in `MessageDestination`.

2. Installation

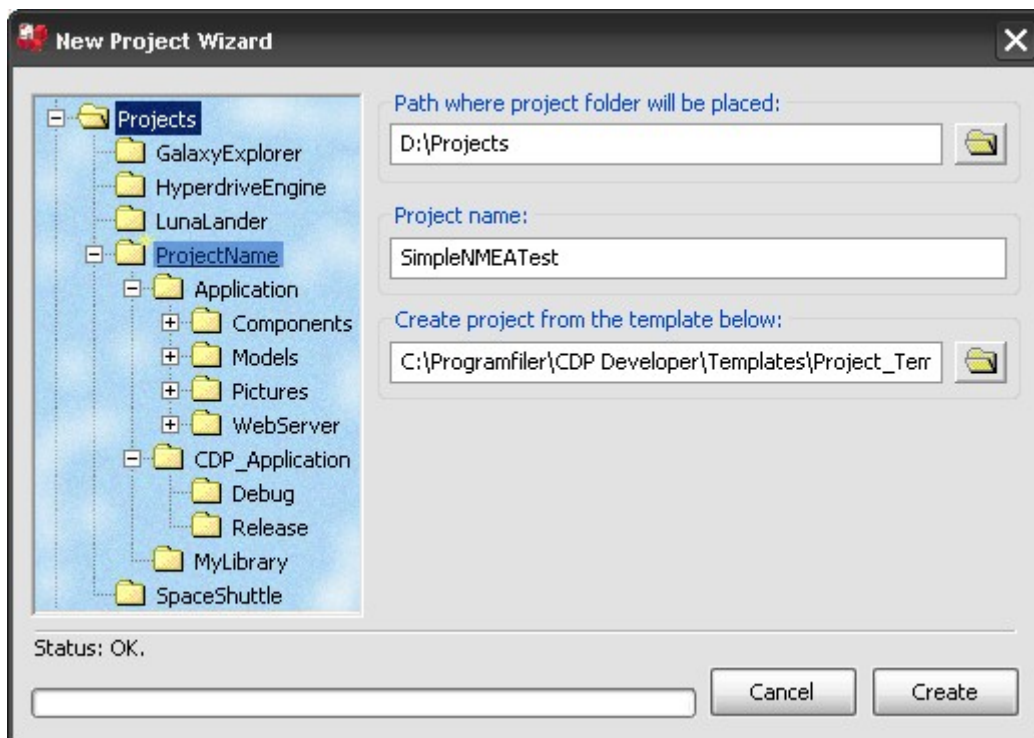
This chapter explains how to install the library containing SimpleNMEA.

2.1. Prerequisites

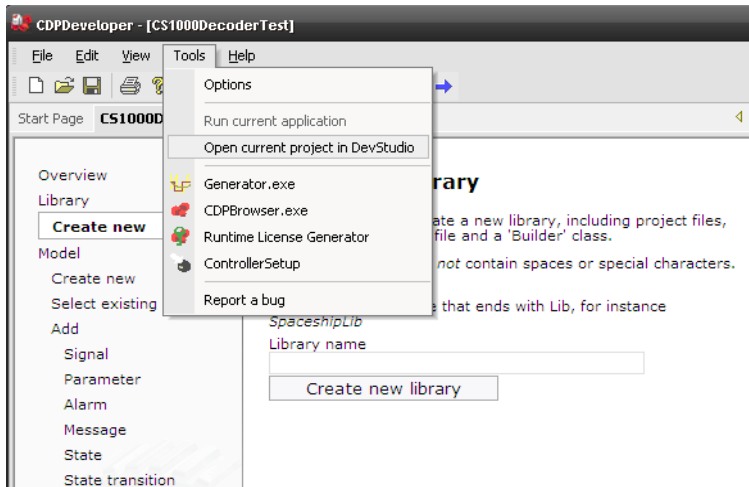
- A valid CDP license
- Familiar with CDP
- CDP version 2.3.1.0

2.2. How to add SimpleNMEA in a new or existing project

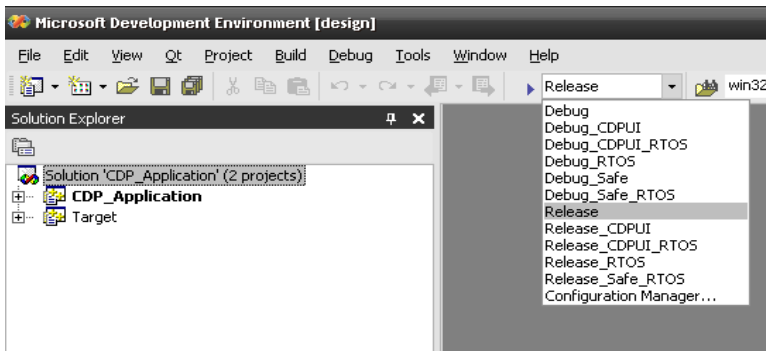
- Start CDPDeveloper located at Start Menu > Programs > CDP > CDPDeveloper
- Make a new project by Selecting File->New, type in project name and click Create (or skip four steps forward and open an already existing project in Visual Studio)



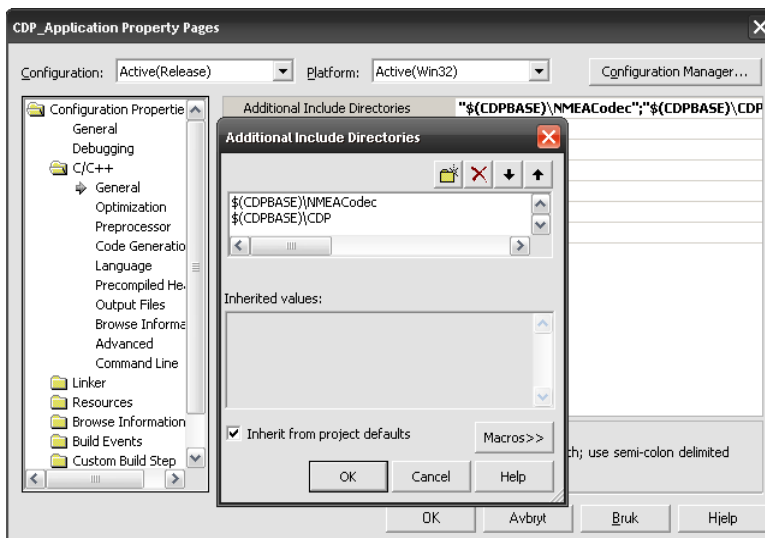
- Choose 'Open current project in Devstudio' from the Tools menu:



- If Visual Studio asks to convert the project, accept this by selecting 'Next'/'Finish'/'Close' until done. Close the conversion report.
- In Visual Studio, select the configuration that is right for your target platform.

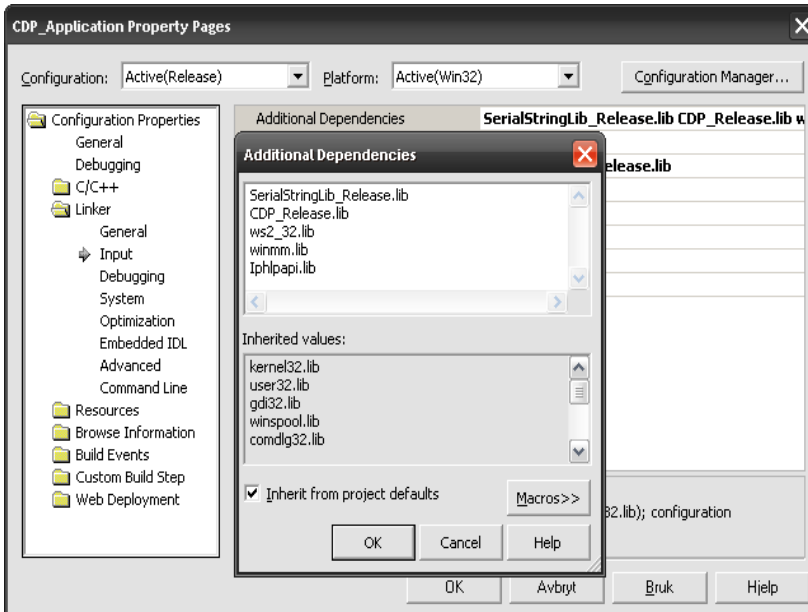


- Select 'CDP_Application' from the 'Solution Explorer', right-click and select Properties.
- In C++/Additional include Directories, make sure it says: “\$(CDPBASE)\SerialStringLib”; “\$(CDPBASE)\CDP”. When compiling for Ontime RTOS, the following include is also required: “;\$(RTTarget)\Include”.

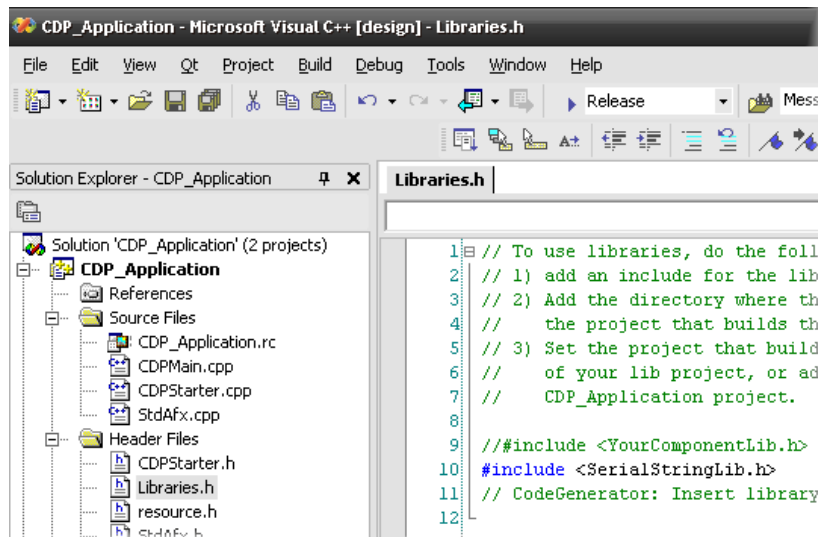


The compiler will look in the directories specified in 'Additional Include Directories' for files that you #include in your .cpp and .h files. If you get an error 'Can not open include file ...' then it is most likely caused by a missing include directory, or that the file you #include does not exist.

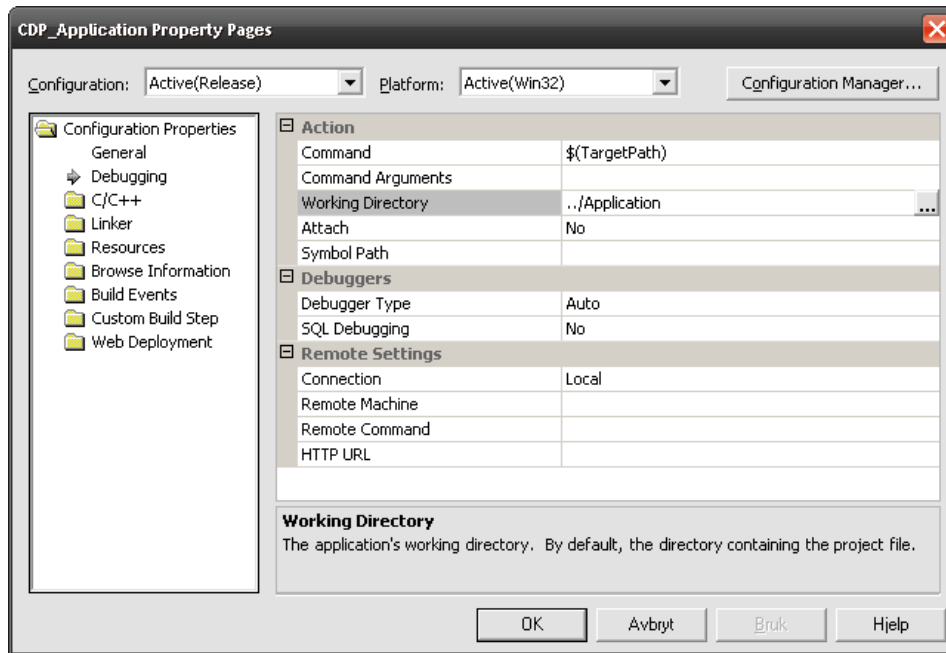
- In Linker->Input, make sure you list SerialStringLib_Release.lib and CDP_Release.lib in addition to all the win32 libraries you need. This will ensure that the linker finds all the functions that is referenced in the code. Note that when compiling for other Operating Systems you will need to replace these libraries with the ones for the target OS.



- In the 'Solution Explorer', inside the 'CDP_Application' project, locate the Header file Libraries.h, and add the line #include <SerialStringLib.h>:



- Finally, make sure that the working directory of the project is set to ../Application. This will ensure that the executable is started where the configuration files are located.



2.3. Modify the project xml files

Add the following to your project's Application.xml:

Inside the <Components> element, add an instance of a SimpleNMEA component, for instance:

```
<Component Name="SimpleNMEA" src="Components/SimpleNMEA.xml"></Component>
```

Or, inside the <Subcomponents> element, add:

```
<Subcomponent Name="SimpleNMEA" Model="SimpleNMEA" src="Components/SimpleNMEA.xml"> </Subcomponent>
```

This will tell CDP to initialize a component named "SimpleNMEA" from a component file located at "Components/SimpleNMEA.xml". Make sure that your Models\ folder contains a SimpleNMEA.xml model file, or the component will not be initialized correctly.

3. Appendix

3.1. NMEA Checksum Calculation

3.1.1. About

When wanting to produce custom strings that include checksum, read the following section. Before you implement this procedure, consider disabling the checksum in the xml file as described in the User Manual.

3.1.2. The checksum procedure

The NMEA checksum procedure is implemented as follows:

The start of the string is found to be the first character after '\$' or '!' (whichever comes first). The characters from this position up to but excluding '*', are exclusive ored together; i.e.:

```
pos = &string[position after $ or !];
Checksum = character[pos];
pos++;
while(pos!=endpos)
{
    Checksum = Checksum^character[pos];
    pos++;
}
```

The checksum is then splitted into a high and low nibble (half-byte) which is converted into two hexadecimal characters (0-9/A-F). For instance, the checksum value 0x4d is split into two characters with the ASCII values of '4' and 'D'.