Using DAS Studio 3 to configure the KAD/CBM/103

TEC/NOT/074

This technical note describes how to use DAS Studio 3 to configure the KAD/CBM/103 to parse messages. This paper discusses the following topics:

45.1   Overview

The KAD/CBM/103 is a 4-channel Cross Channel Data Link/Motor Controller Data Link (CCDL/MCDL) bus monitor. It can parse up to 127 unique messages per channel, with up to 65 bytes of data per message.

The CCDL/MCDL message structure is shown in the following figure. Messages are separated by gaps that are a minimum of 11 null bits wide. Bytes inside messages are transmitted without gaps.
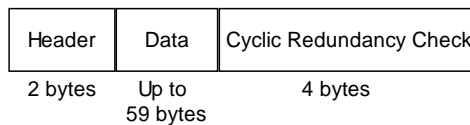
Header	Data	Cyclic Redundancy Check
2 bytes	Up to 59 bytes	4 bytes

Figure 45-1: Typical CCDL/MCDL message structure

The header is composed as shown in the following figure.

Bits 15 -11	Bit 10	Bits 9 - 6	Bits 5 - 0
Message ID	Master/slave bit	Freshness counter	Message length

Figure 45-2: Composition of header bytes

Elements of the header are described as follows:

Message ID: a unique 5-bit identifier per message.

Master/slave bit: identifies whether the message came from a master unit (1) or a slave unit (0).

Freshness counter: 4-bit counter which increments every time a particular message ID is sent.

Message length: the number of data bytes contained in the current message.

45.2   About the CCDL/MCDL protocol

The CCDL/MCDL protocol uses a command-reply format. CCDL master devices request data from slave devices, which send replies using the same message ID. Considering the following example where a master device requests data with a message ID of 0, the header breakdown is as follows:

Message ID = 00000

Master bit = 1

Freshness counter = 0000

Message length = ******

When a slave device receives this request, it replies using the same message ID, incrementing the freshness counter by 1. The header breakdown is then:

Message ID = 00000

Master bit = 0

Freshness counter = 0001

Message length = ******

This continues until all required data from the slave has been received by the master.

45.3 Using DAS Studio 3 to configure the KAD/CBM/103

DAS Studio 3 is used to create a configuration which contains the various elements which make up your data acquisition system. You may use this configuration file to manage and program these elements. To see how hardware is represented in the DAS Studio 3 graphical user interface, see Figure 1 in the *DAS Studio 3 User Manual.*

45.3.1 Creating a basic configuration

This section describes how to use DAS Studio 3 to create a basic configuration which includes the KAD/CBM/103.

1. On the **Quick Access Toolbar** or the **File** menu, click **New**.
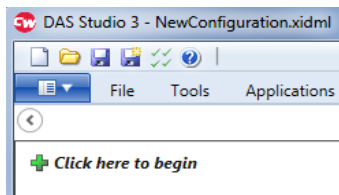
2. To add a chassis which represents the hardware you have connected, right-click on the overview node and click **Add Instrument**.
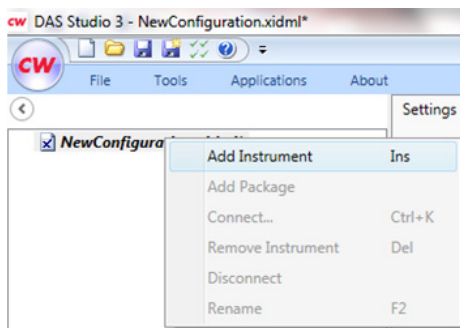

    Instruments Palette opens. For information on **Instruments Palette** settings, see the *DAS Studio 3 User Manual*.
3. On the **DAU** tab, select the chassis connected and then click **Add**.
4. Click + to expand the chassis node.
    Empty slots appear under the chassis indicating where modules can be added.
5. To add a controller module which represents the hardware you have connected, right-click on empty slot 2 and click **Add Instrument**.
    Instruments Palette opens.
6. Select a controller module, for example a KAD/BCU/140/C, and click **Add**.
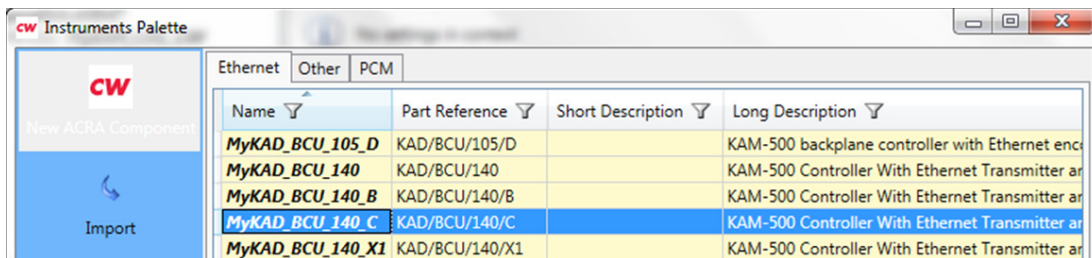
The module is added to slot 2.
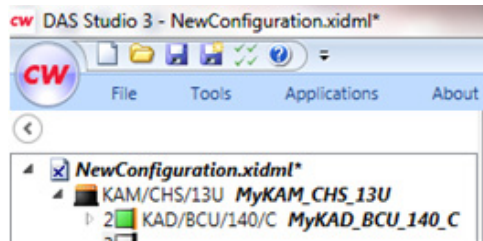
7. To add the KAD/CBM/103 you have connected, right-click on an empty slot and click **Add Instrument**. **Instruments Palette** opens.
8. On the **Bus Monitor** tab, select the KAD/CBM/103 and click **Add**.
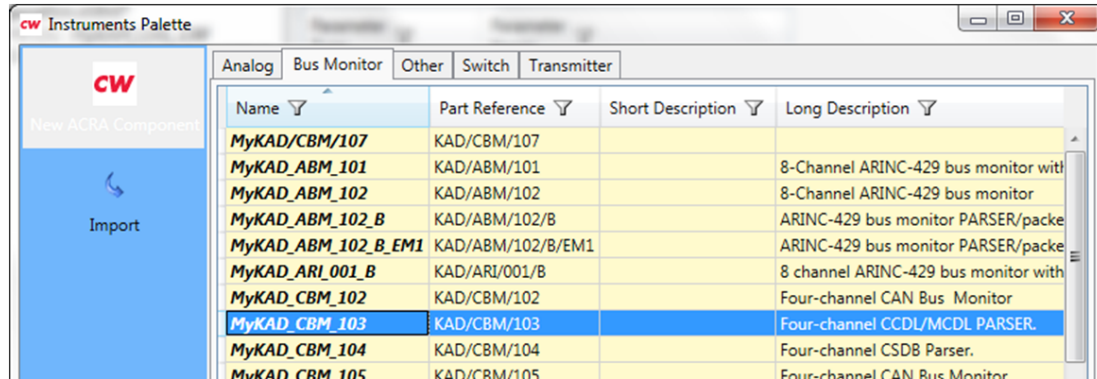
The module is added to the previously empty slot.

45.3.2 Setting bit-rates for the KAD/CBM/103

After adding the KAD/CBM/103 to your configuration, you can set bit-rates for channels.

1. If required, click + to expand the KAD/CBM/103 node and the **Inputs** node.
2. On the **Settings** tab, set the bit-rate for each CCDL channel by changing the values in the **Baud Rate** field. Also, change the value in the **Fill Value** field as required.
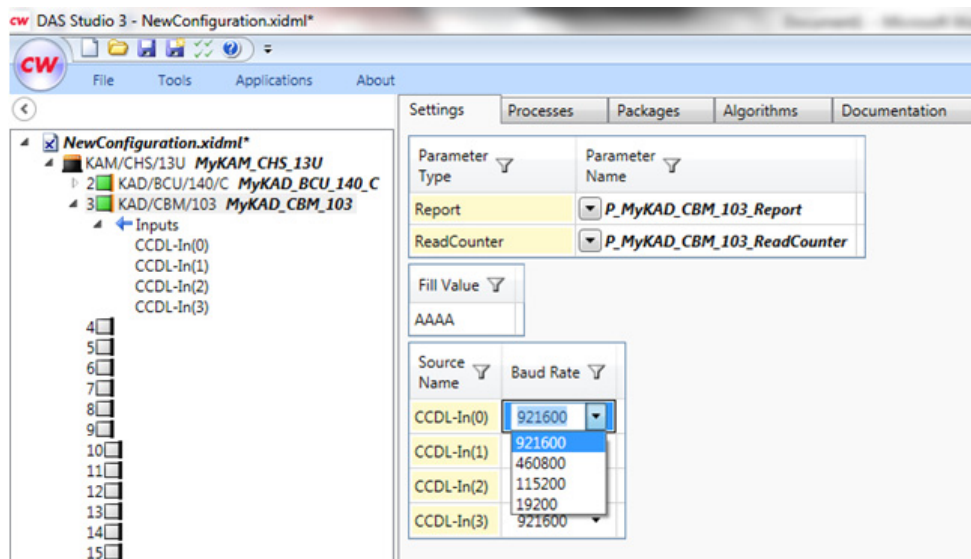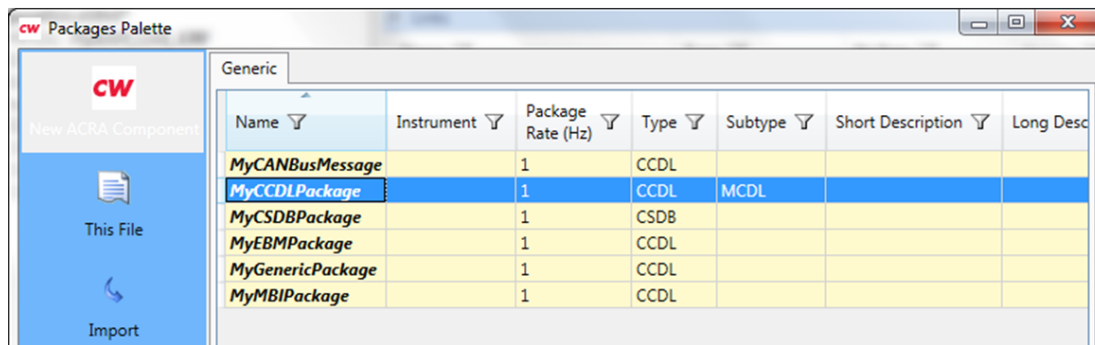
45.3.3 Adding CCDL packages

After setting bit-rates for each channel, add CCDL packages to each channel.

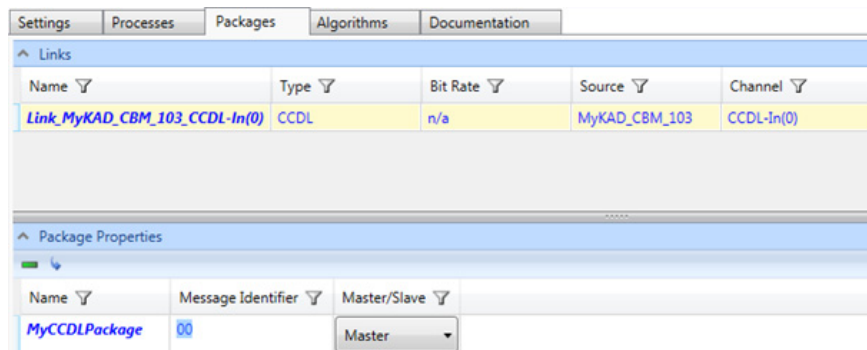1. To add a package, right-click the channel where you want to add the package and click **Add Package**.
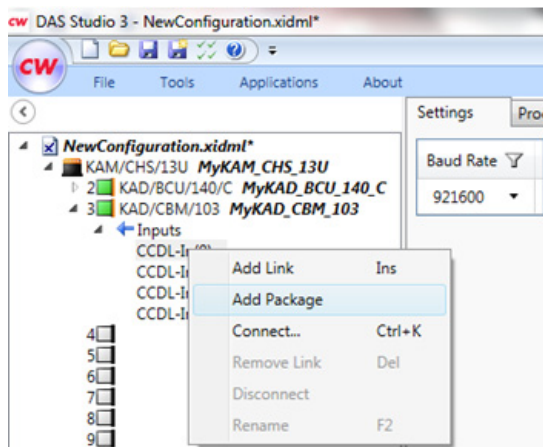
Packages Palette opens.

2. On the **Packages Palette**, select *MyCCDLPackage* and click **Add**.

3. On the **Packages** tab, set the **Message Identifier** field in the **Package Properties** pane.

NOTE: Values must be in hex and in the range 00 to 1F.

4. In the **Master/Slave** field, select the message type.
   Options available are: **Master**, **Slave** or **Both**.

45.3.4 Adding parameters to a CCDL package

This section describes how to add parameters to the CCDL packages already defined.

1. In the **Placed Parameters** pane, click the **Import Parameter** button.
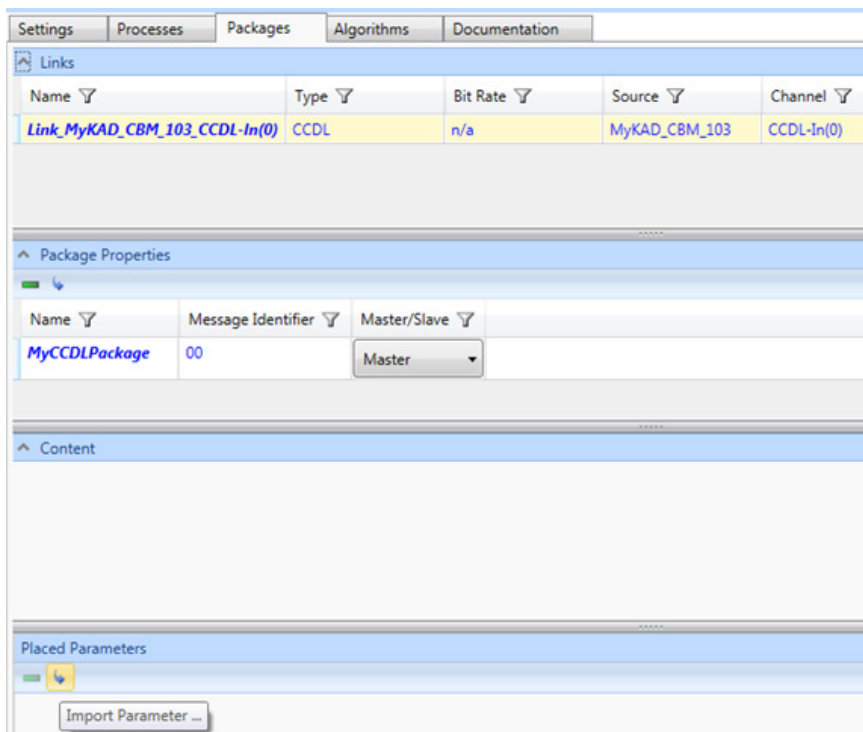

Parameters Palette opens.
NOTE: 32 x 16-bit parameters are required.

2. To filter the list of parameters so that only 16-bit parameters are displayed, click the icon in the **Bits** column heading and type **16** in the text box that appears.
3. Click the **Contains** button and select **Equals** from the filtering choices.
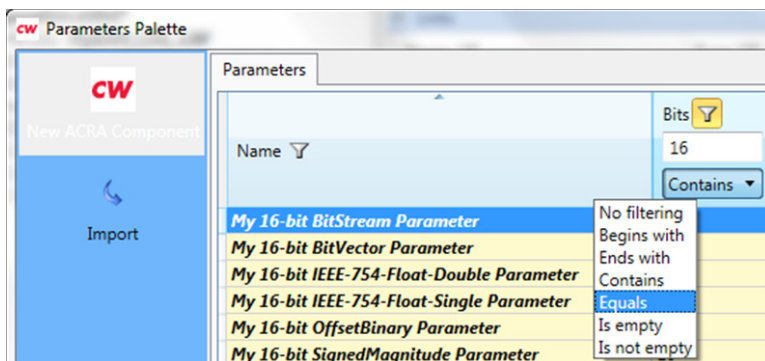
4. Select the first 32 x 16-bit parameters available.
   For information on using the **Shift** and **Ctrl** keys for selecting multiple fields, see the *DAS Studio 3 User Manual.*
5. Select the **Use My Renaming Rules** radio option.
6. Select the **Rename To** check box and type a unique parameter name in the box provided.
   For information on the **Use My Renaming Rules** and **Rename To** fields, see the *DAS Studio 3 User Manual.*

7. Click **Add**.
   On the **Packages** tab, 32 data words are added to the CCDL message.
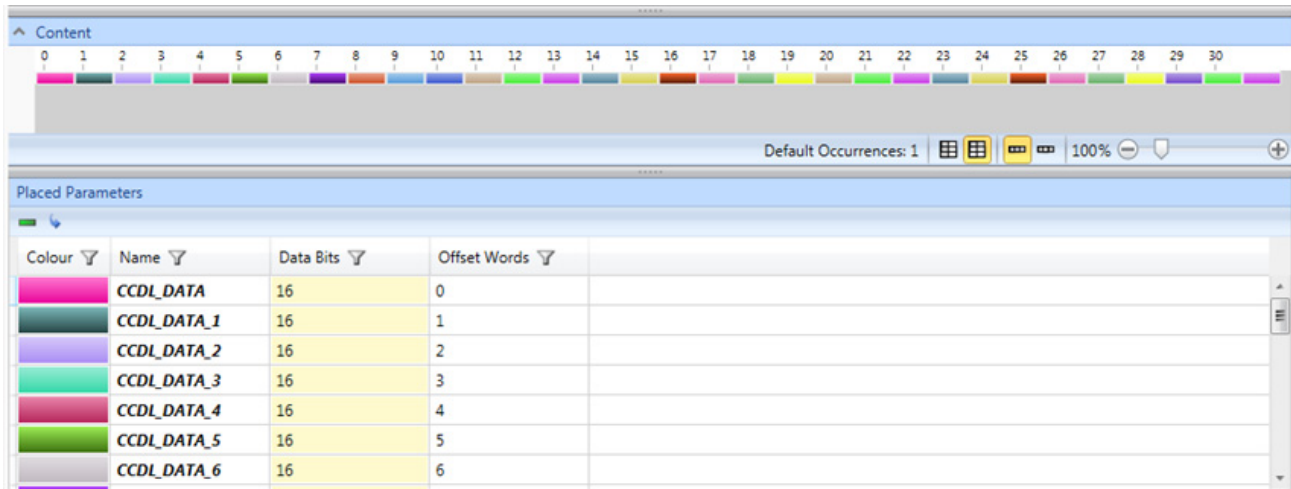

45.3.5 Placing incoming CCDL parameters

After adding parameters, it is necessary to place them into an outgoing package at a rate defined by you.

1. If required, click + to expand the controller node and the **Outputs** node.
2. Right-click the **Ethernet** link and select **Add Package**.
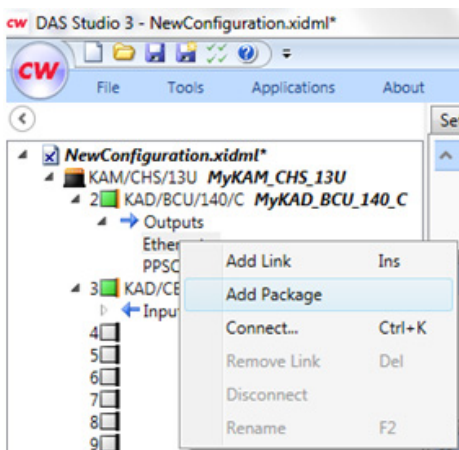
   Packages Palette opens.
3. On the **iNET-X** tab, select the **MyPlacediNET-XPackage** package type and click **Add**.
   On the **Packages** tab (ensuring the controller module is in context), an empty iNET-X packet with a **Stream ID** of **00** is created.
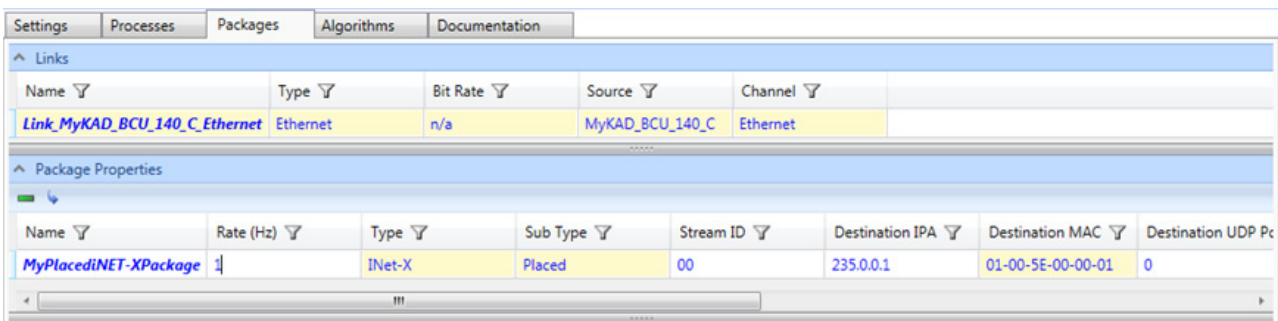
4. Set values for the **Rate (Hz)**, **Stream ID**, **Destination IPA**, and **Destination UDP Port** as required.

5. To place the CCDL parameters into this packet, click the **Import Parameter** button.
   Parameters Palette opens.
6. On the **Parameters Palette**, select all 32 of the CCDL data words previously created and click **Add Reference**.
   On the **Packages** tab, the CCDL parameters are added to the outgoing packet.

45.3.6 Verifying configuration

Use the Verify tool to check that the current configuration contains no errors.

1. On the **Quick Access Toolbar** or the **Tools** menu, click **Verify**.

When verification is complete, a message displays to confirm whether the configuration was verified successfully.

TIP! Details of the verification are available in the Message Server window. To display the Message Server window, double-click its icon in the notification area.

Double-click to open Message Server
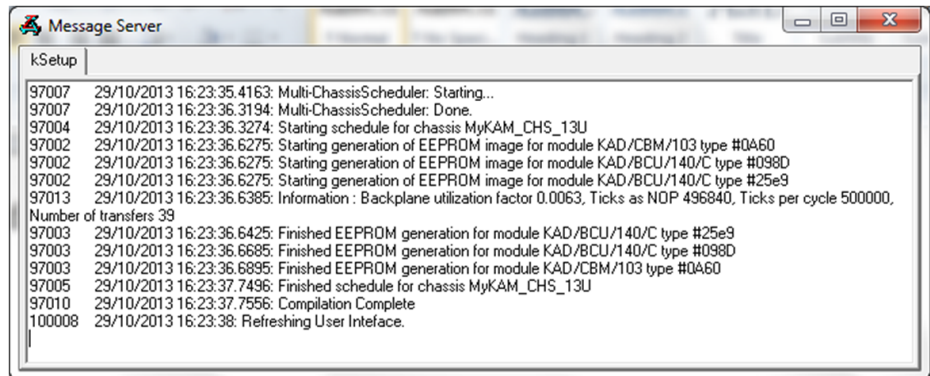
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