How to associate UDS Record numbers with Snapshot data

Version 1.0
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Application Note AN-IDG-1-009

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1.0 Overview

Beginning with version 5.0, CANdelaStudio supports snapshot data associated with DTCs or record numbers. This document describes how to prepare a CANdela template to use record numbers for snapshot data.

2.0 Preparing the CANdela template

2.1 Step 1: Creating a Data type for the Record number

The UDS Record number is transferred as a hexadecimal number indicating the record. You can use e.g. a “HexDump” data type of 1 Byte length for this purpose. However, if no suitable data type exists, you must create one first:

1. Go to chapter “Data types” of the CANdela template.
2. Click on [New…]. Select option “Raw value”.
3. Rename new data type to e.g. “Record number (1Byte)” and set length to 1 byte (fix). Select Encoding “Unsigned” and Display Format “Hexadecimal”.
4. Click on [OK].

2.2 Step 2: Creating the Protocol service

Let us use UDS Service “ReadDTCInformation” (0x19) as an example. Sub-function 0x05 of this service transmits the DTC snapshot records associated with a client defined record number to the client (see ISO/DIS 14229-1.2, page 185ff).

To create the protocol service, go to chapter “Protocol services” of the CANdela template and follow these instructions:

2. In the properties dialog of the new protocol service, select tab “Request”.
   - Add constant “Report type” (value: 0x05, specification “subfunction”).
   - Add proxy “Record number” (semantics “Data”, 1Byte fix).

3. Now select tab “Positive Response”.
   - Add constant “Report type” (value: 0x05, specification “subfunction”).
   - Add iteration (end) “Data list”.
   - Add proxy “Record number” (semantics “Data”, 1Byte fix) to the iteration.
   - Add proxy “DTC” (semantics “DTC”) to the iteration.
   - Add proxy “Status of DTC” (semantics “DTC status”) to the iteration.
   - Add proxy “Number of IDs” (semantics “Any”, 1Byte fix) to the iteration.
   - Add multiplexer “Snapshot record” to the iteration. Use proxy “Record number” as selector.

Your protocol service should look like following now:

![Protocol Service](image)

Figure 1: Request message
2.3 Step 3: Adding the Protocol service to Fault memory

Now we are ready to add the new protocol service to the diagnostic class template describing the Fault memory. To do so, go to chapter “Diagnostic class templates” of the CANdela template and select the sub-chapter of the Fault memory diagnostic class template. Do the following now:

1. Under “Used protocol services”, click on the magic line of the table. Dialog New Service template appears.
2. Select the new protocol service from the list and click on [OK].
3. Rename the new service template to e.g. “Read Snapshot data by Record number”
4. Combine proxies “Record number” and “Record number 1” with each other.
5. If necessary, combine proxies “DTC” and “Status of DTC” with those already existing in the diagnostic class template.

2.4 Step 4: Setting the Data type

Finally, we must set the data type created by step 1. This is done like following:

1. Go to the diagnostic instance of the Fault memory in the base variant (if it does not already exist, create it).
2. Activate service “Read Snapshot data by Record number” (see step 3).
3. Select tab “Record number”. The telegram table must contain one data object only. Create one if necessary.

4. Set data type of the data object to the data type created in step 1 (“Record number (1Byte”).

Select tab “Snapshot record” now. It should look like following:

![Snapshot record table](image)

**Figure 3: Entry mask of the Fault memory**

### 3.0 Editing Snapshot data in the CANdela document

Creating snapshot data for a specific record number is fairly easy now:

1. On tab “Snapshot record” of the Fault memory instance, click on [New]. Dialog **Create individual Snapshot record** appears.

2. Enter start and end value of the range of record numbers for which a snapshot record shall be created.

3. Click on [OK].

CANdelaStudio creates a snapshot record for every record number specified. You can change to a specific snapshot record by selecting the record number from the combo box above the table. If you want to delete a snapshot record, click on [Delete] and select the record number you would like to delete.
4.0 Additional Resources

Further information on how to create data types, protocol services and diagnostic class templates can be found in the online help of CANdelaStudio.

VECTOR APPLICATION NOTE
AN-IDG-1-001 How to get a CANdela document translated
AN-IDG-1-003 How to use the CANdelaStudio command line
AN-IDG-1-004 ODx support in Vector tools
AN-IDG-1-005 How to edit states and state groups
AN-IDG-1-006 CANdelaStudio product activation FAQ

5.0 Contacts

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<tr>
<th>Vector Informatik GmbH</th>
<th>Vector CANtech, Inc.</th>
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<tbody>
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<th>Vector France SAS</th>
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