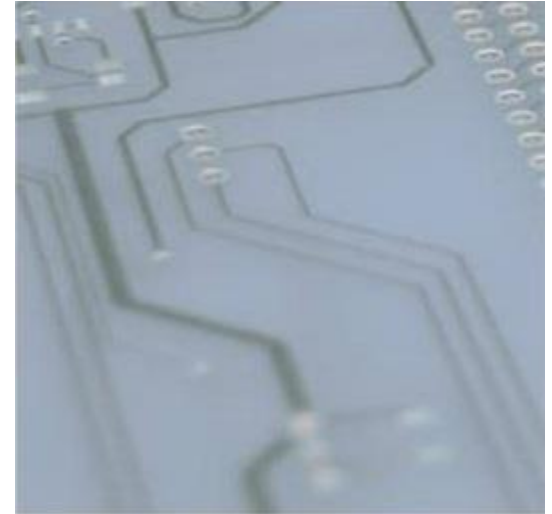
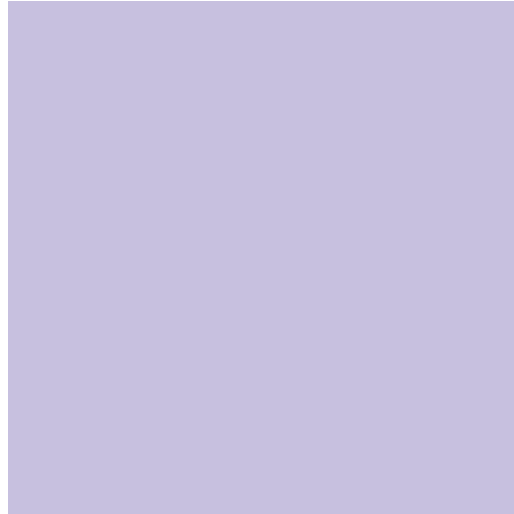
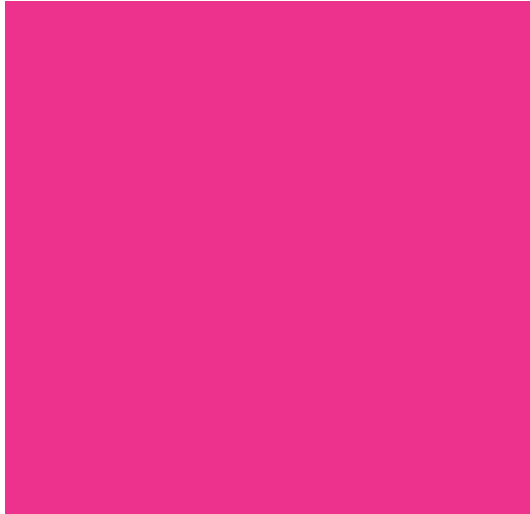


# CanEasy Automation Scheduler



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CanEasy provides the many ways to make your life easier,  
by **automating** things:

## Shortcut plugin:

- Global keyboard shortcuts, even for highly automated complex functions

## Formula plugin:

- Changing signals and messages based on powerful formulas

## Modulator plugin:

- Changing signal values based on ramps, sines and much more

## Programming:

- VBA / VSTA / Remote control via COM

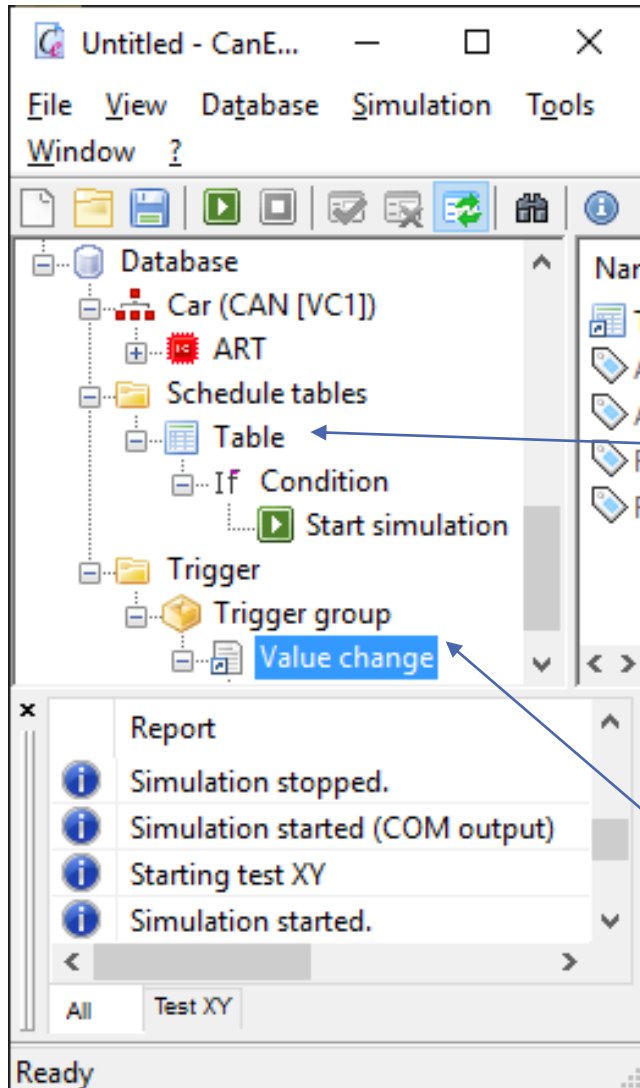
## Scheduler:

- Easy and fast definition of sequences of actions

---



# Overview



Simulation of a flasher control unit

Sw\_Blinker: Steering column switch for  
turn on/off the flashlight

Lt\_Blinker: Signal to the light control unit  
to switch on the light

## Table:

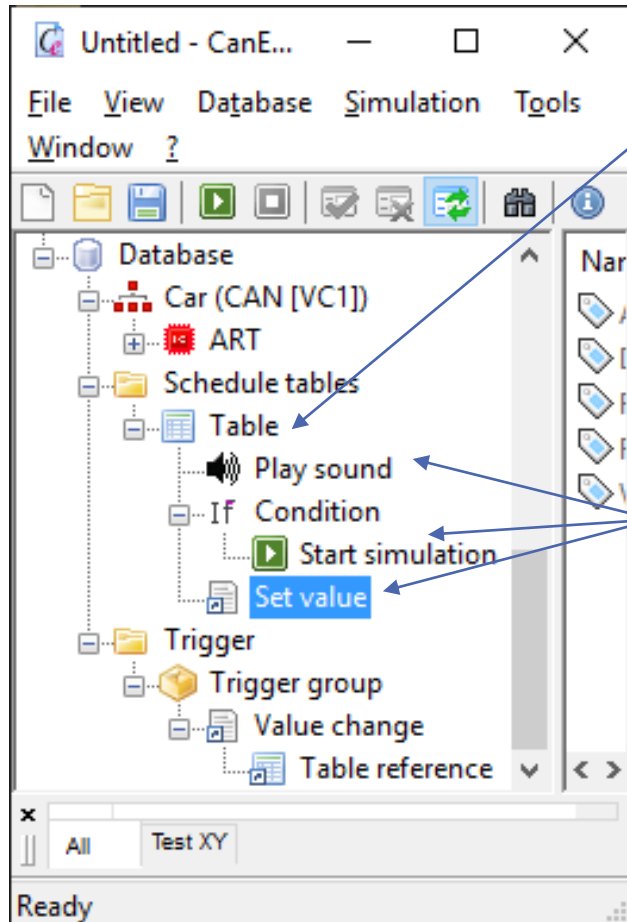
- Is a sequential executed collection of actions

## Trigger:

- Used to start the execution of a Table



# Tables: Definition



## Table:

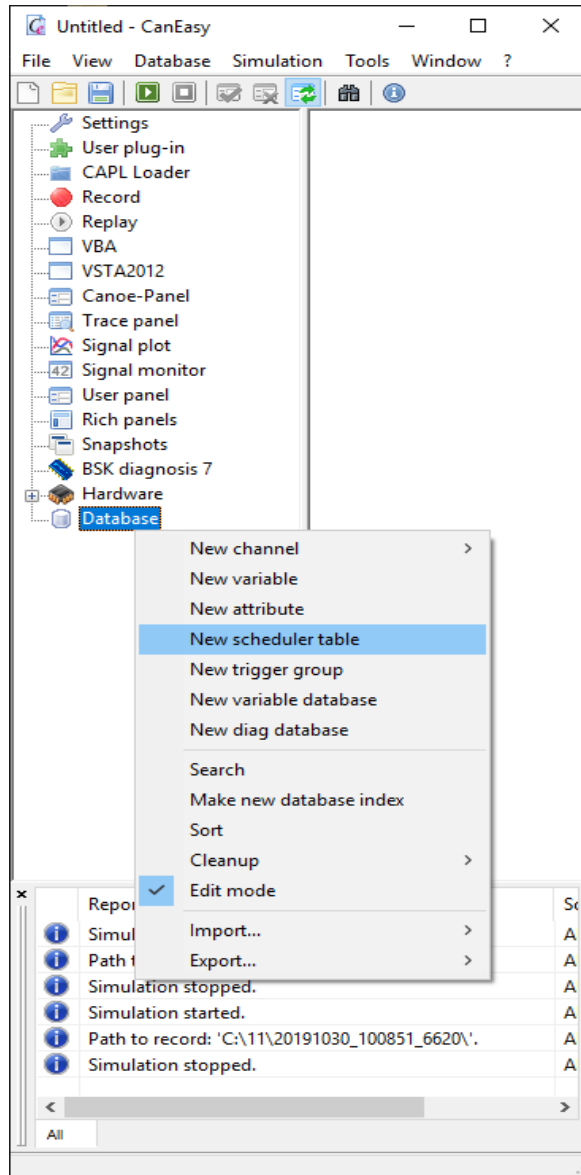
- Is a sequential executed collection of table actions

## Table actions:

- Set signal
- Condition
- Activate table



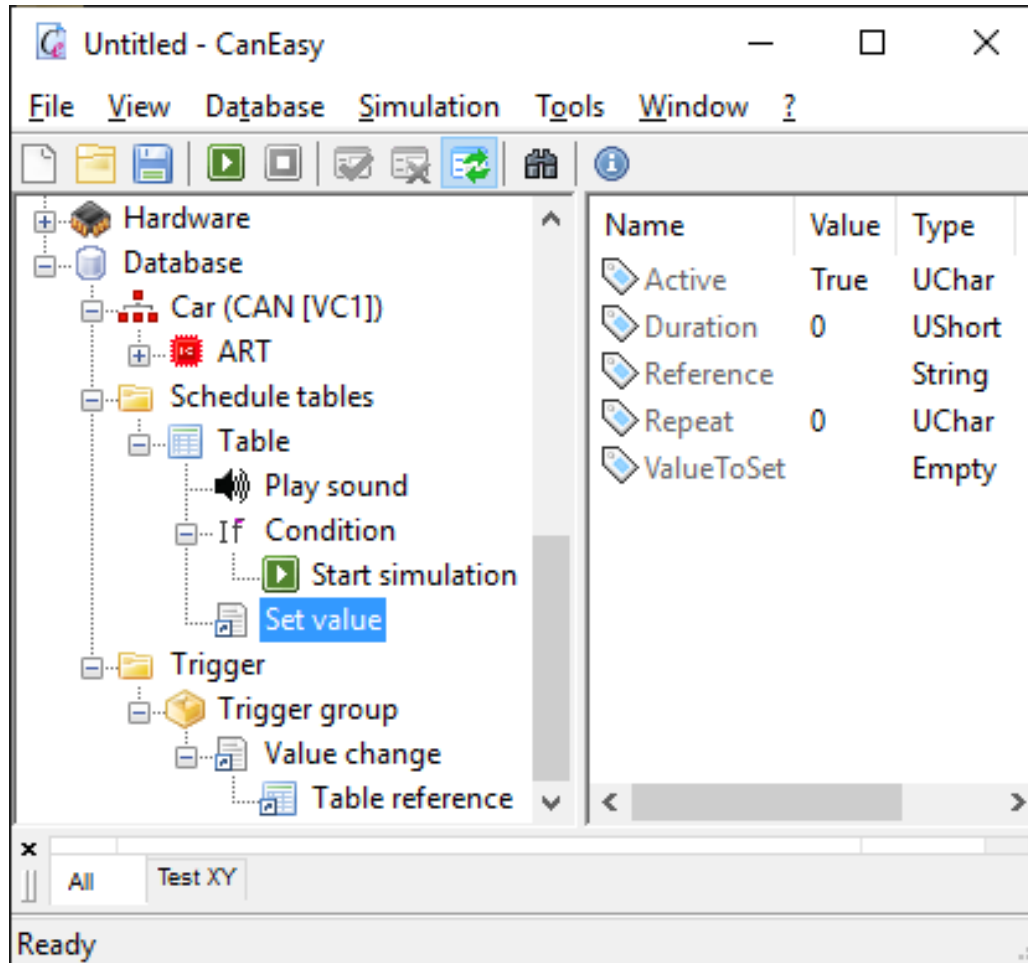
# Add new Scheduler Tables



- Right click on „Database“
- Click on „New Schedule Table“
- Enter name



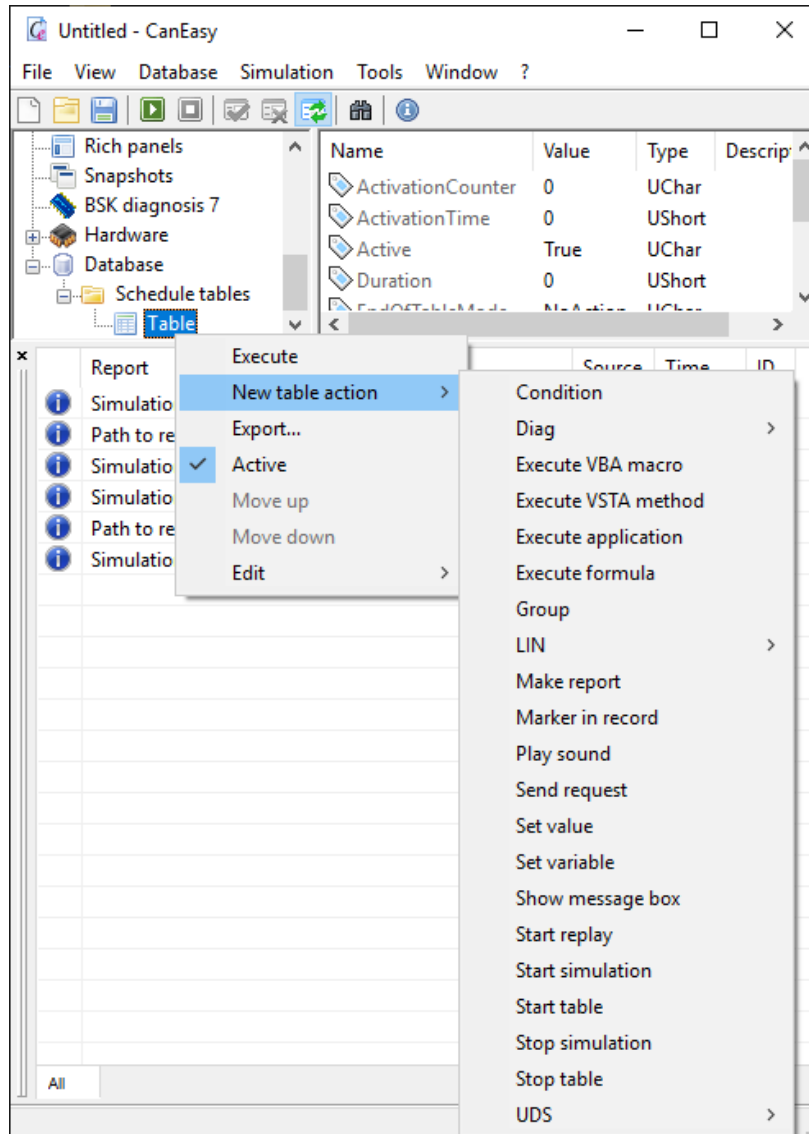
# Setting for Scheduler Tables



- **Start with simulation**  
Table execution is started automatically when simulation is started
- **Activation Time**  
Delay for starting the table after simulation start
- **Stop with simulation**  
Table execution is stopped automatically when simulation is stopped
- **End of Table Action**  
Repeat: the table is started again after its execution is finished  
NoAction: No action



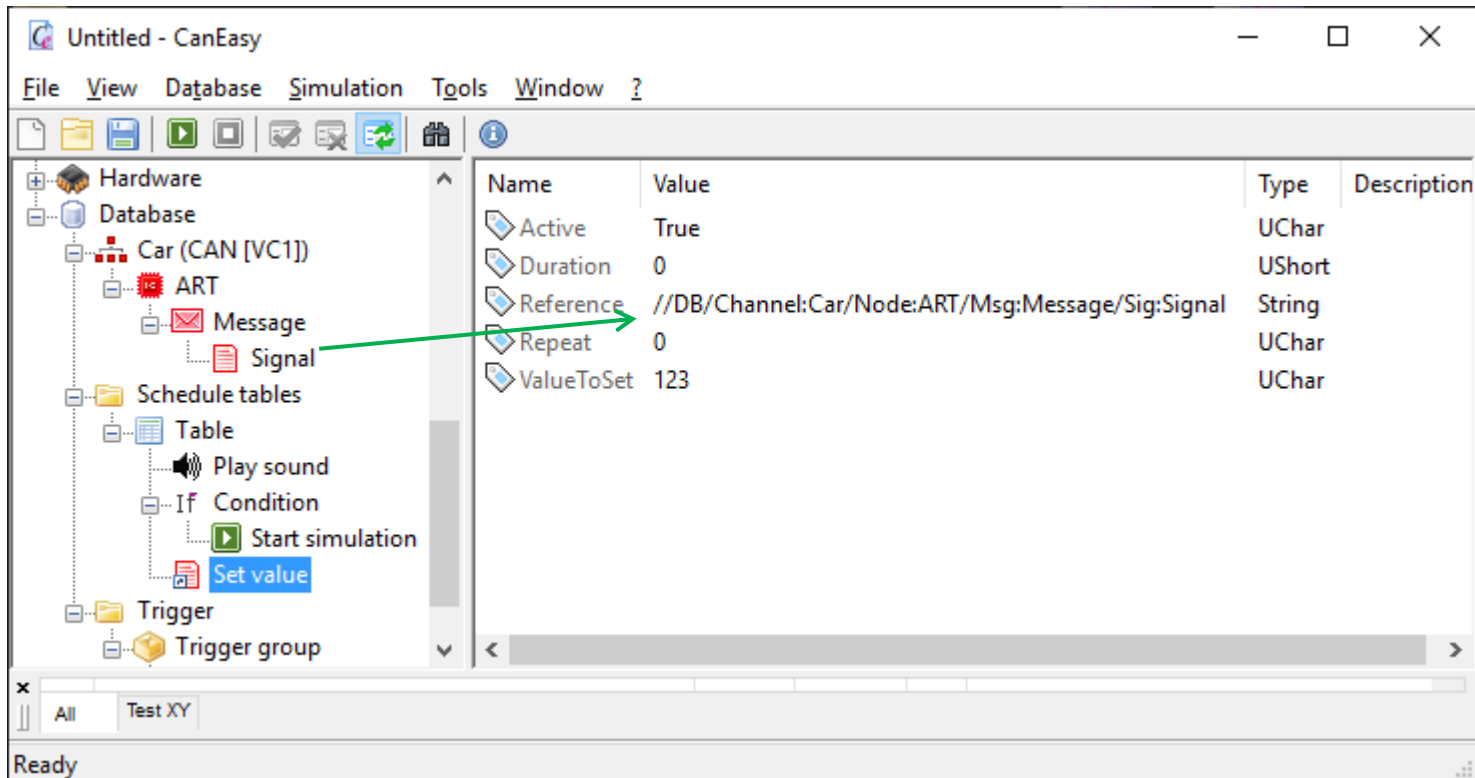
# Add new Tables Actions



- Right click on Scheduler Table
- Click on "New Table Action"
- Choose a Table Action e.g. "Set Value"
- Enter name



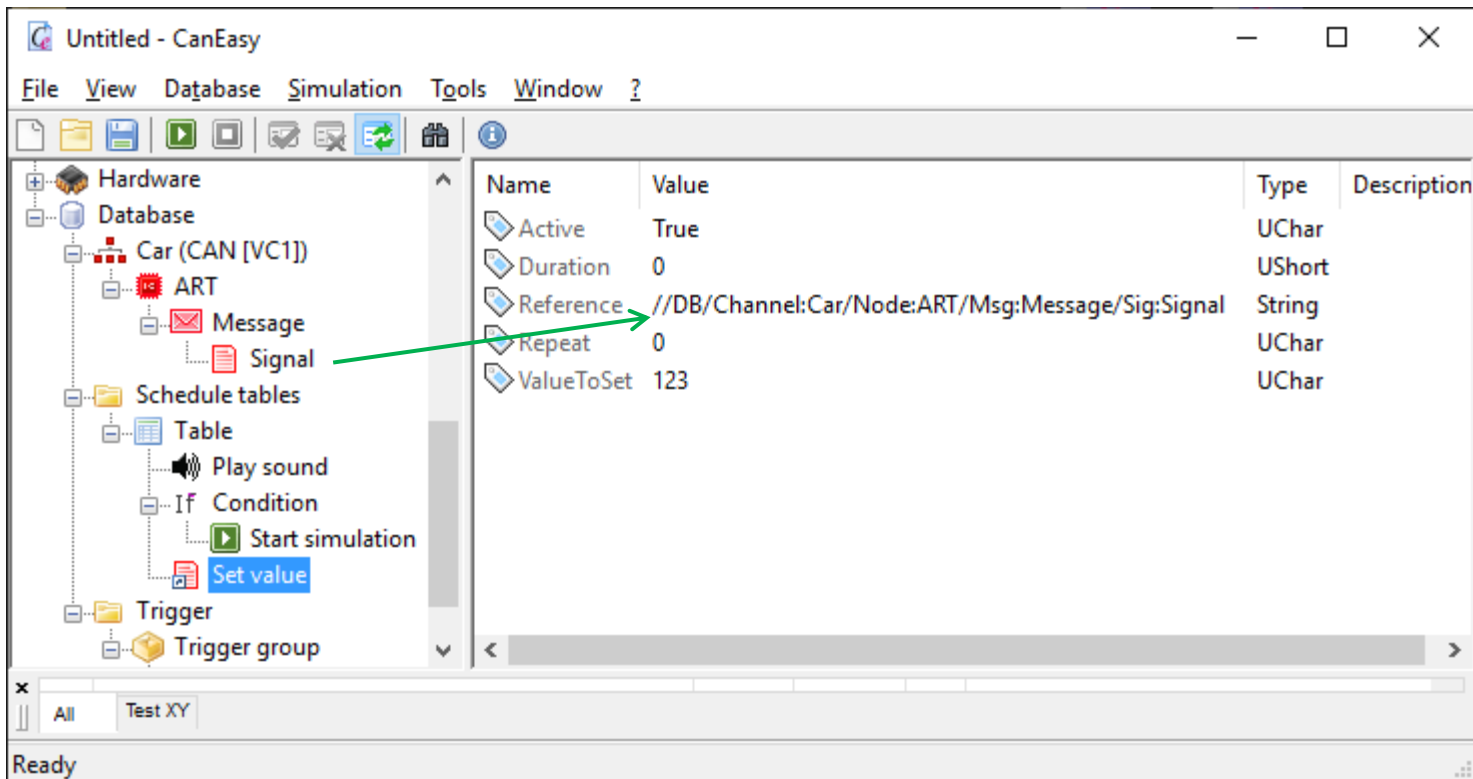
# Configure a Table Action "Set Value"



- **Reference:** Path to a "value" [Signal, Environment Variable, ...]
- **ValueToSet:** Value which is set to the reference
- **Duration:** Time to wait until the next table action is executed



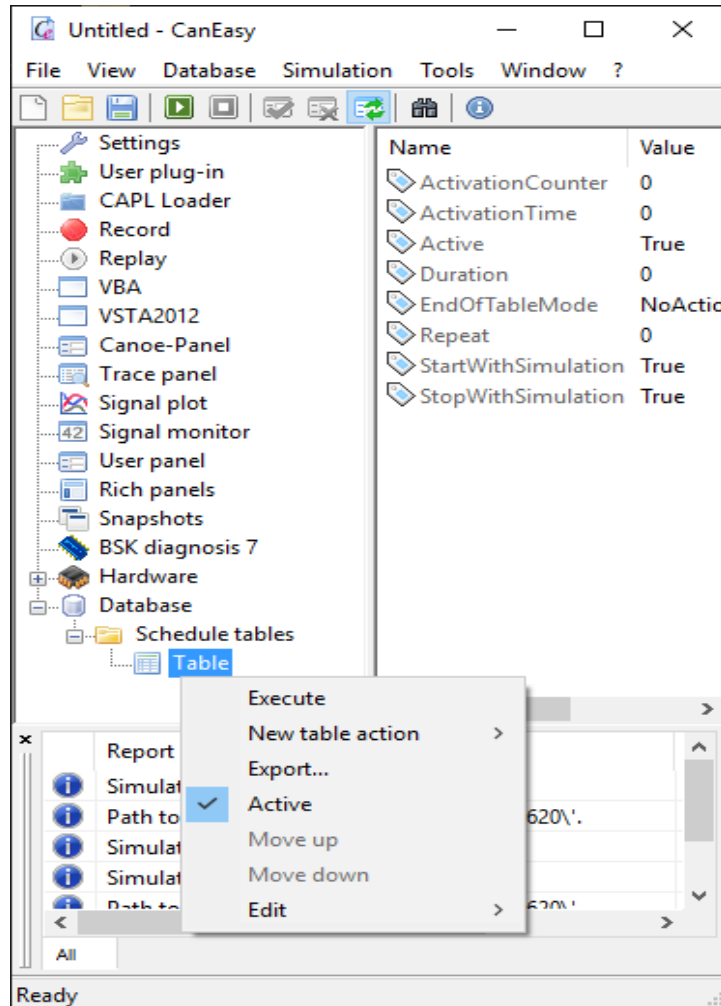
# Configure a Table Action "Condition"



- **Reference:** Path to a "value" which should be compared
- **Value:** Value which is compared to the referenced value
- **Operator:** Comparison operator (equal, not equal, smaller, larger)



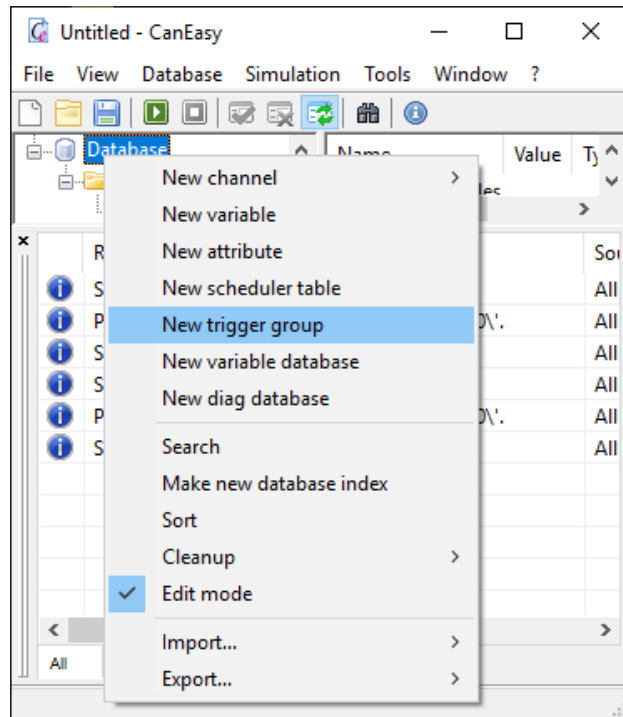
# Starting a Table



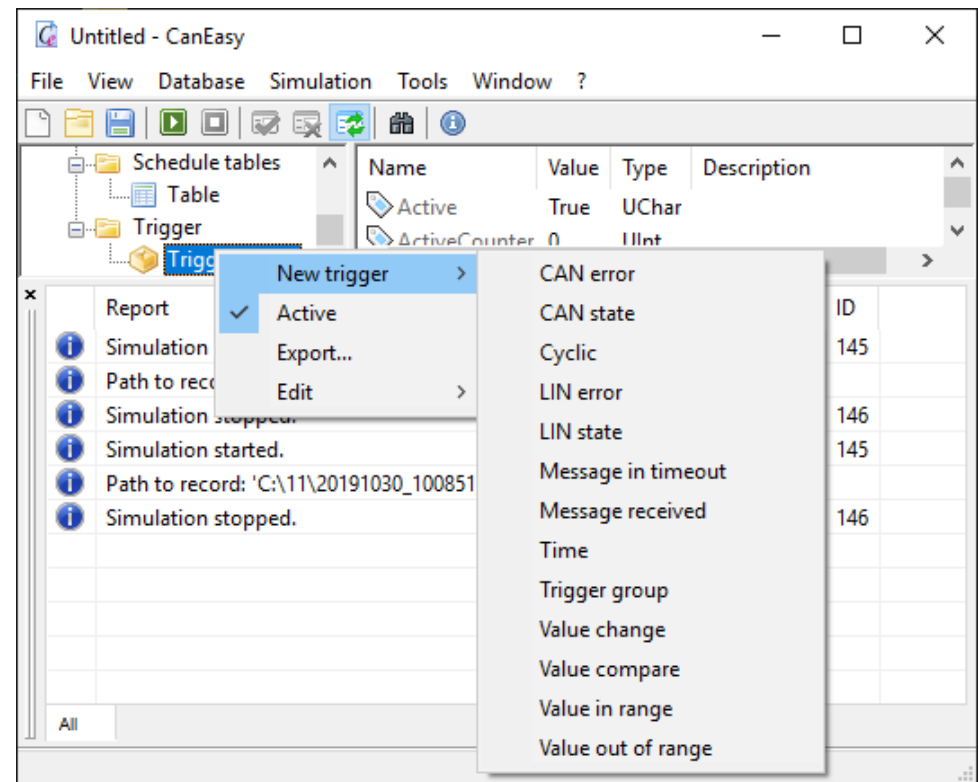
- Right Click the Table  
Click on "Execute"
- Automatically when simulation is started
- By a Trigger e.g.:
  - Changing of a value
  - Value is equal or in range
  - Receiving of a message
  - Bus Error, Timeout
  - Time
  - Cyclic



# Add a Trigger



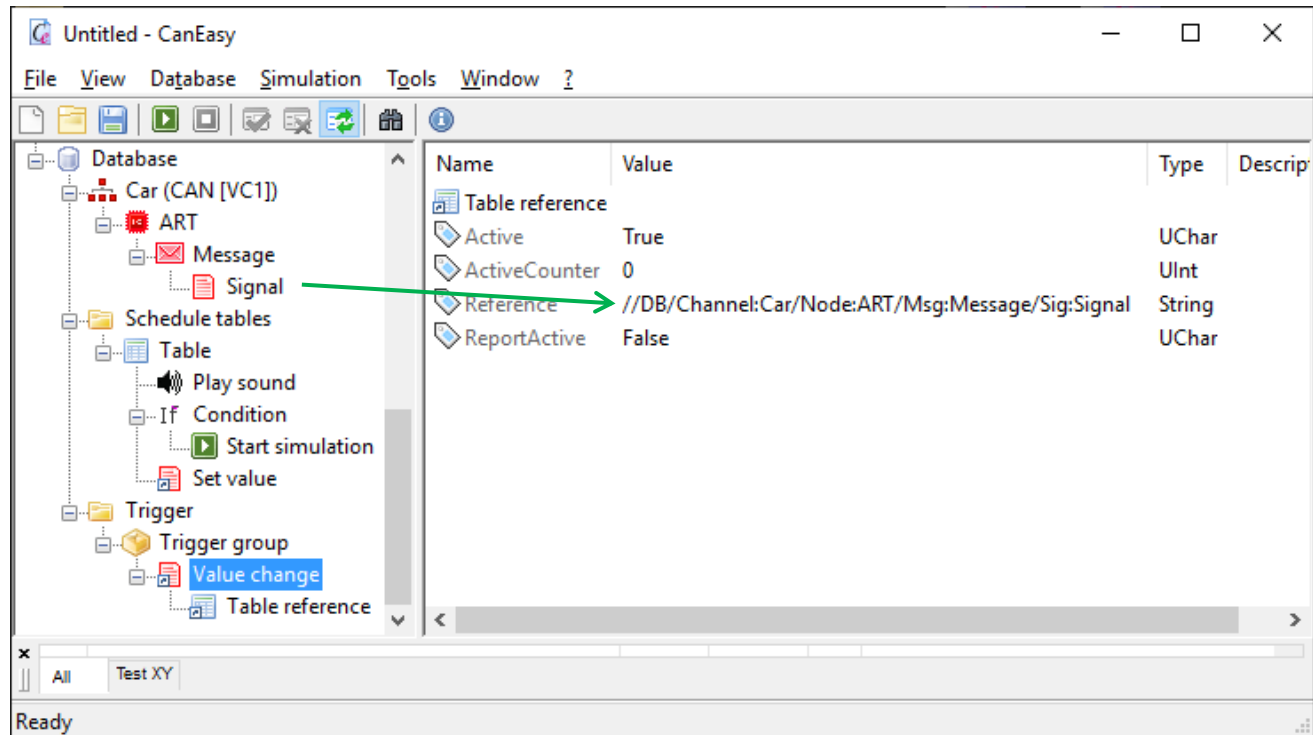
- Right click on Database
- Click on "New Trigger Group"
- Enter name



- Right click on Trigger Group"
- Click on "New Trigger"
- Choose trigger
- Enter name



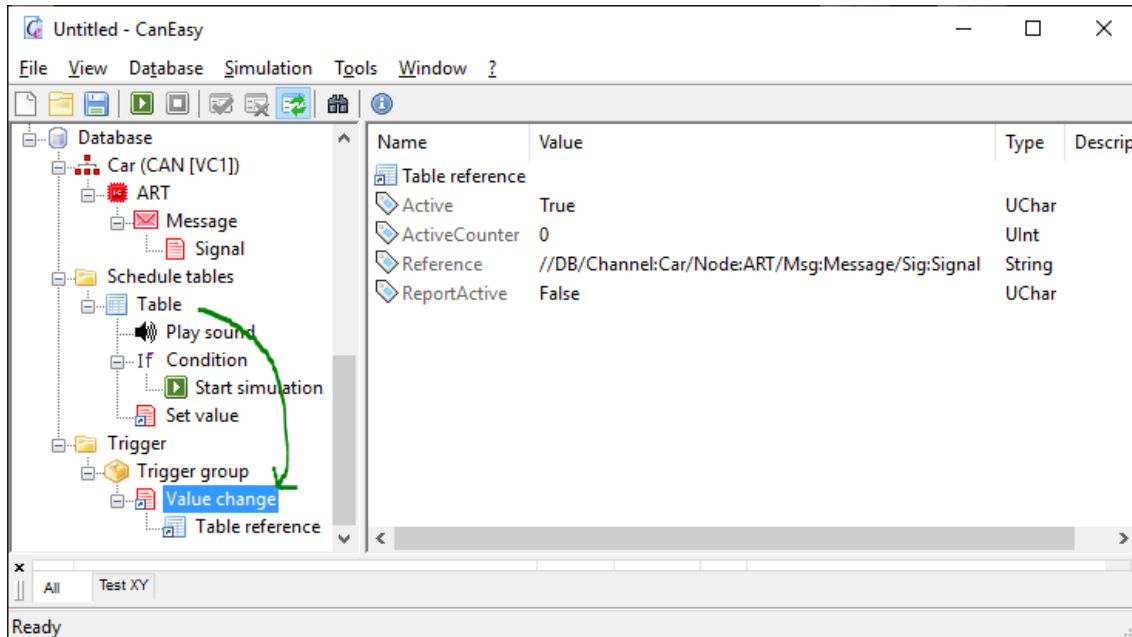
# Configure a Trigger



- **Reference:** Path to a “value” [Signal, Environment Variable, ...]
- **Value:** Value the reference should be compared with
- **Operation:** Comparison operator [equal, not equal, smaller, larger]

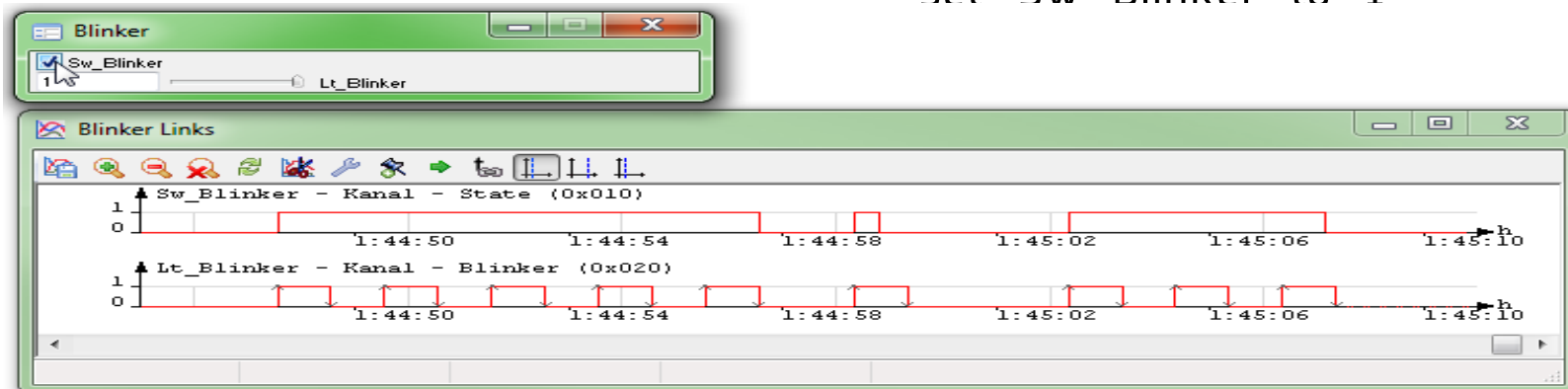


# Add a Table to a Trigger



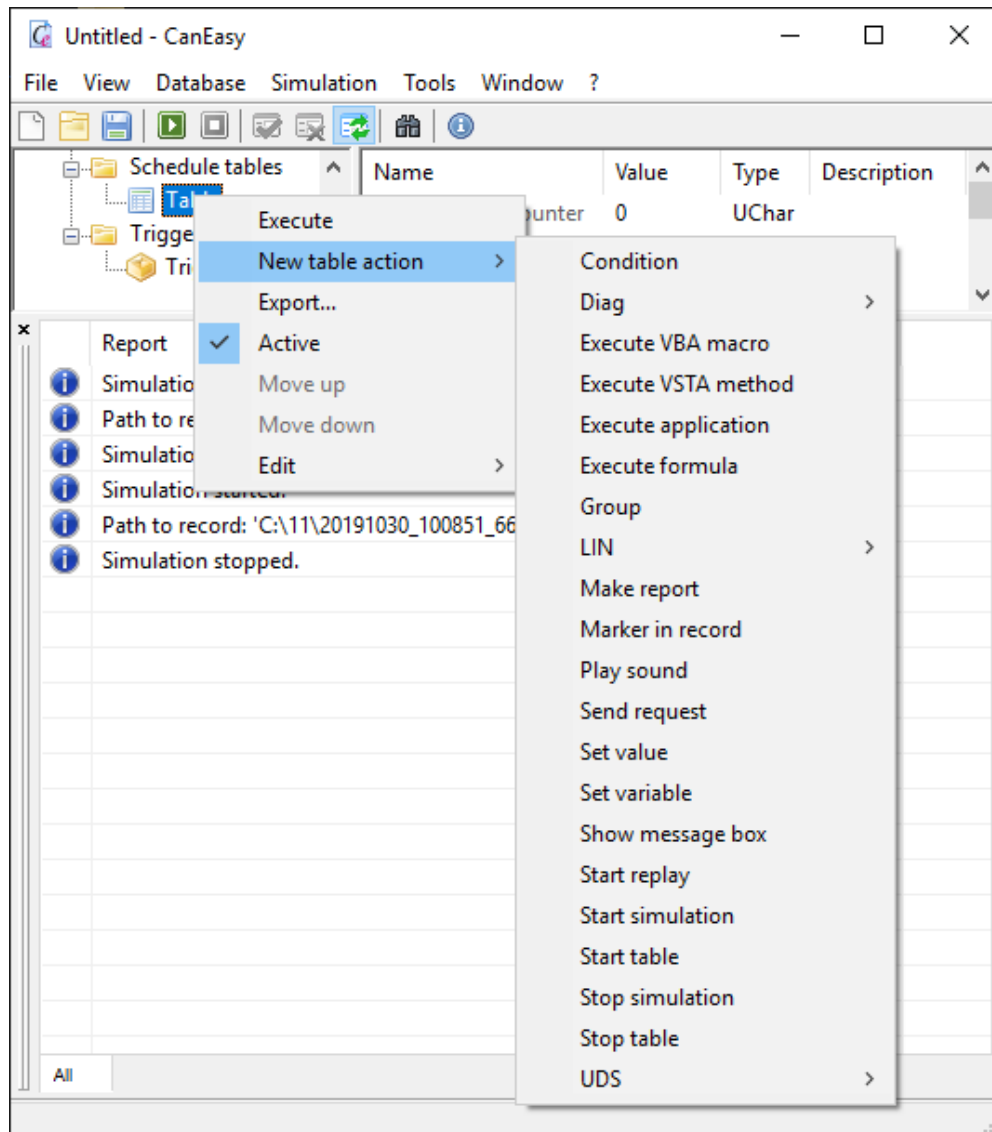
Drag n' drop the table  
onto the trigger

Start the simulation and  
set "Sw Blinker" to "1"

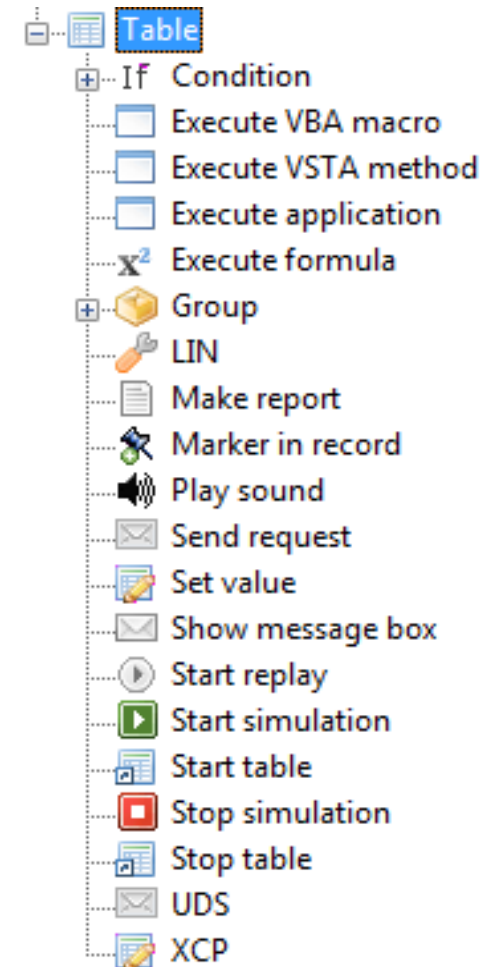




# Tables actions: Overview

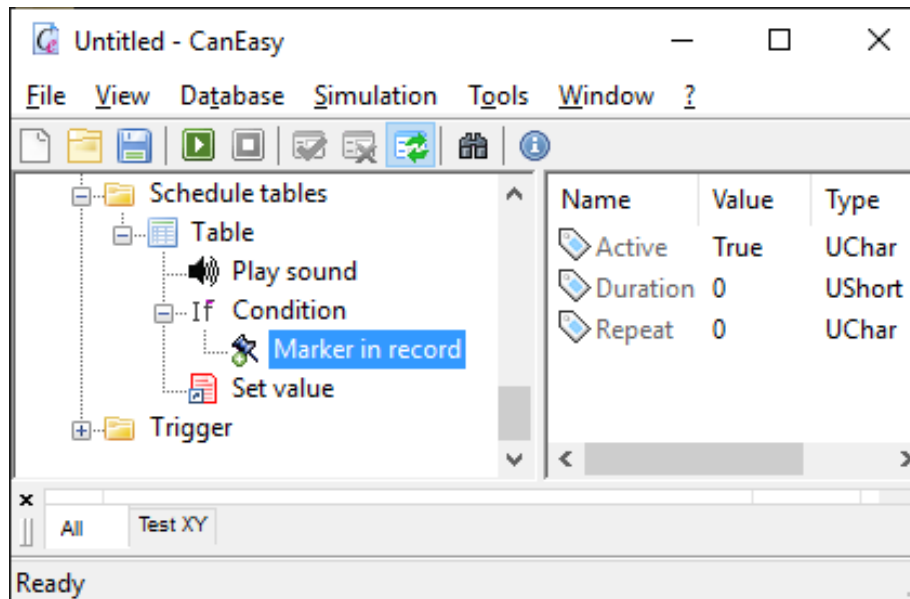


## List of actions:





# Table actions: Common parameter



Each table action has at least the following parameters:

**Active:** Can be used to activate/deactivate table action

**Duration:** Minimum time of the table action in ms

**Repeat:** Number of repetitions



# Table action: Make report

**Function:** Generates a report in the report window

**Parameters:**

**Content:**

Content which will be shown in the report window at the bottom of the screen.

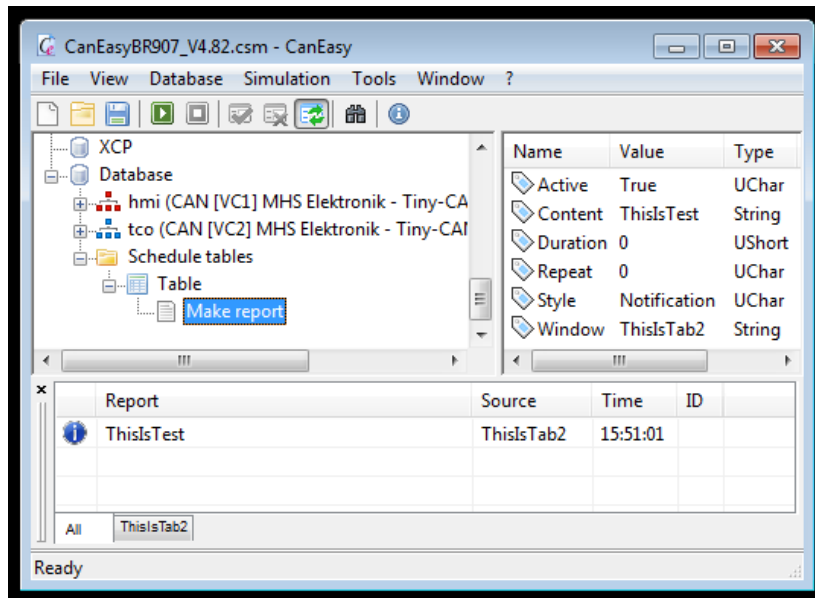
**Style:**

Changes the icon:

Notification, Warning, Error

**Window:**

Describes the tab in the CanEasy report window. „All“ is the standard tab if an empty string is inserted.





# Table action: Marker in record

**Function:** Inserts a marker into the recording.  
(Will be visible in Trace and Polt)

The screenshot displays two windows from the CanEasy software. The left window, titled 'Untitled - CanEasy', shows the 'Table' action in the 'Schedule tables' list. The 'Marker in record' action is selected, and its properties are shown in the right pane: Name (Active), Value (True), Type (UChar), Duration (0), and Repeat (0). Below this, a 'Report' table shows simulation events.

	Report	Source	Time	ID
i	Simulation started.	All	15:25:59	145
i	Simulation stopped.	All	15:29:34	146
i	Simulation started.	All	15:29:40	145

The right window, titled 'New trace 1', shows a list of recorded messages. A green arrow points to a specific entry at timestamp 00846.5960, which is labeled '\*\*\* Marker 1 \*\*\*'.

Timestamp	C	MsgID	Name	Rx	D
00846.1000	1	0x000	Message	Tx	8
00846.2000	1	0x000	Message	Tx	8
00846.3000	1	0x000	Message	Tx	8
00846.4000	1	0x000	Message	Tx	8
00846.5000	1	0x000	Message	Tx	8
→ 00846.5960			*** Marker 1 ***		
00846.6000	1	0x000	Message	Tx	8
00846.7000	1	0x000	Message	Tx	8
00846.8000	1	0x000	Message	Tx	8
00846.9000	1	0x000	Message	Tx	8
00847.0000	1	0x000	Message	Tx	8
00847.1000	1	0x000	Message	Tx	8
00847.2000	1	0x000	Message	Tx	8
00847.3000	1	0x000	Message	Tx	8
00847.4000	1	0x000	Message	Tx	8
00847.5000	1	0x000	Message	Tx	8
00847.6000	1	0x000	Message	Tx	8
00847.7000	1	0x000	Message	Tx	8
00847.8000	1	0x000	Message	Tx	8
00847.9000	1	0x000	Message	Tx	8
00848.0000	1	0x000	Message	Tx	8



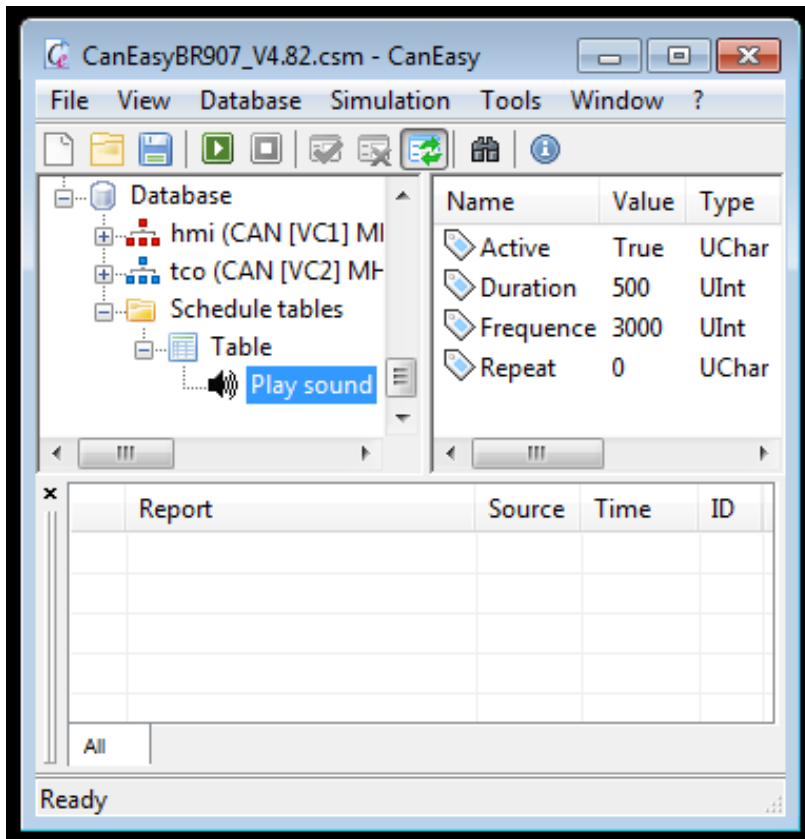
# Table action: Play sound

Function: Plays a sound (via a Sound Card)

Parameters:

Frequency:

Frequency in Hz

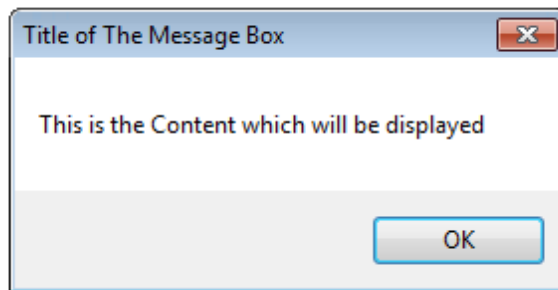




# Table action: Show message box

**Function:** Shows a message box and waits until it is closed by the user

Name	Value	Type
Active	True	UChar
Content	This is the Content which will be ...	String
Duration	0	UShort
Highlight	20	UChar
Reference		String
Repeat	0	UChar
Style	0	Int
Title	Title of The Message Box	String



**Parameters:**

**Title:**

Title of the message box

**Content:**

Content of the message Box

**Style:**

Buttonstyle as integer

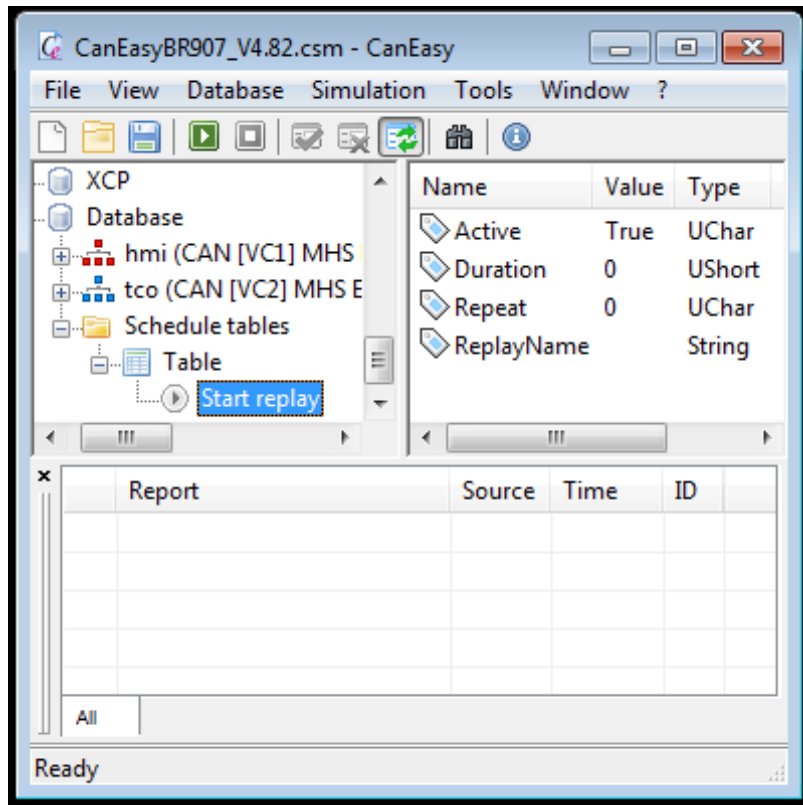
**Reference:**

String reference for the return value from the button[s]



# Table action: Start replay

Function: Starts the replay of a record



Parameters:

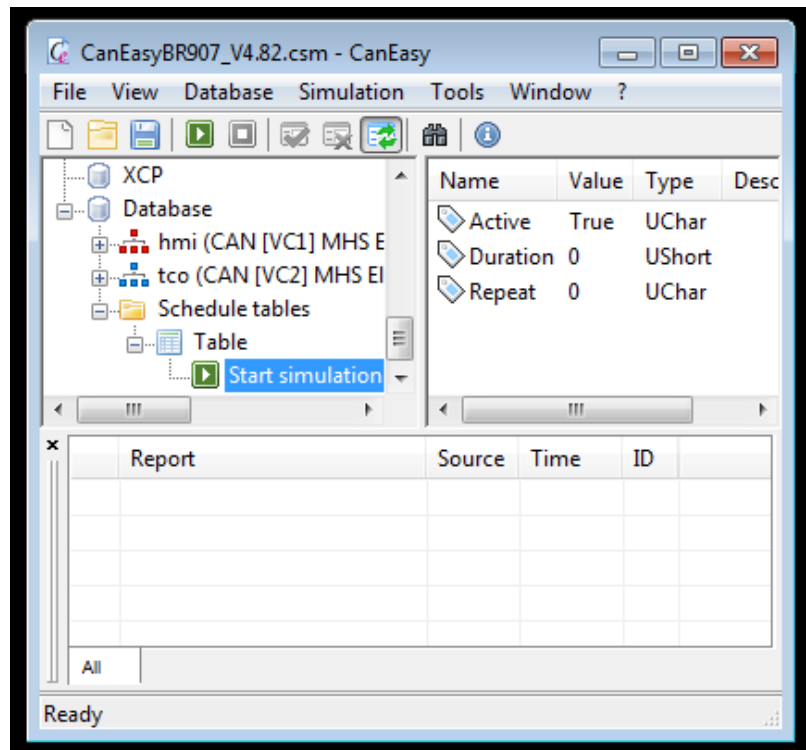
ReplayName:

Name of the replay which has to be started



# Table action: Start simulation

Function: Starts the simulation



Has the same function as  
the green button

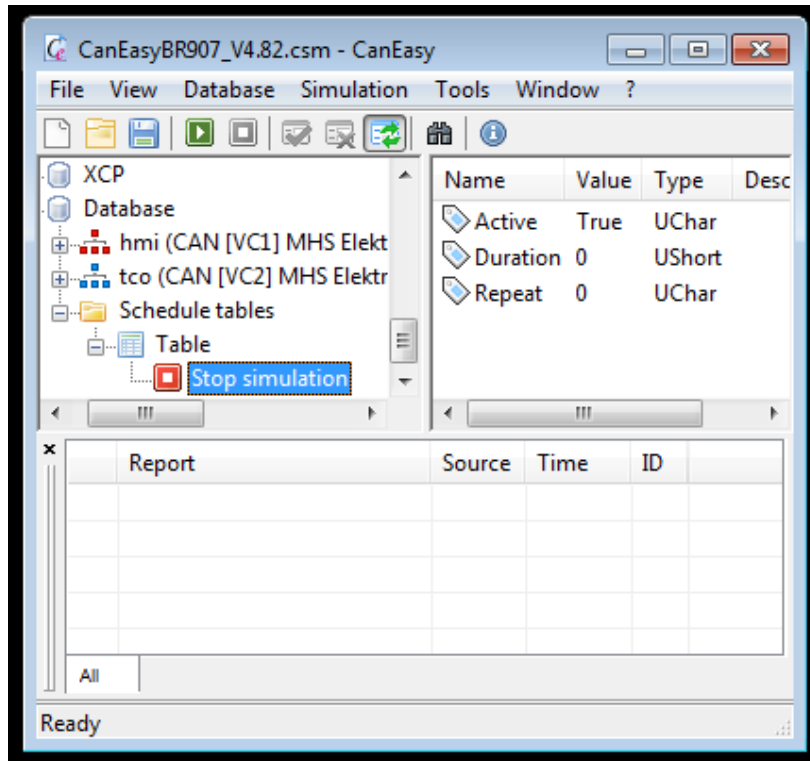
■ Before:     ■ After:





# Table action: Stop simulation

Function: Stops the simulation



Has the same function as the red button

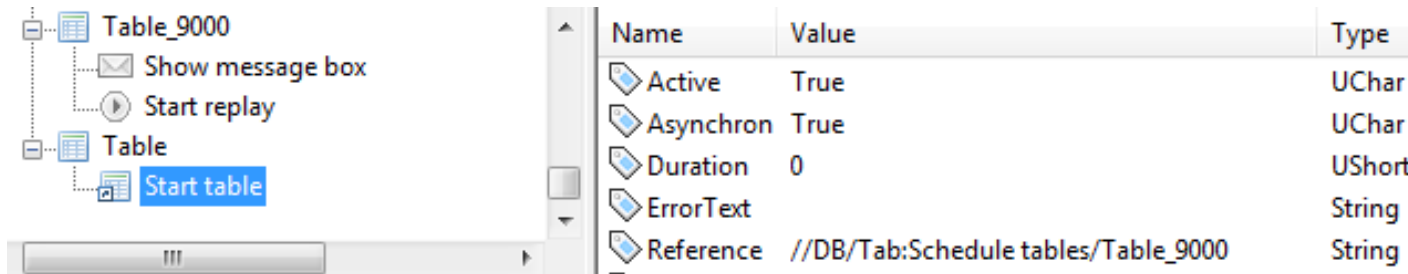
- Before:
- After:





# Table action: Start table

**Function:** Starts the execution a table



**Parameters:**

## Reference:

Path of the table which has to be executed

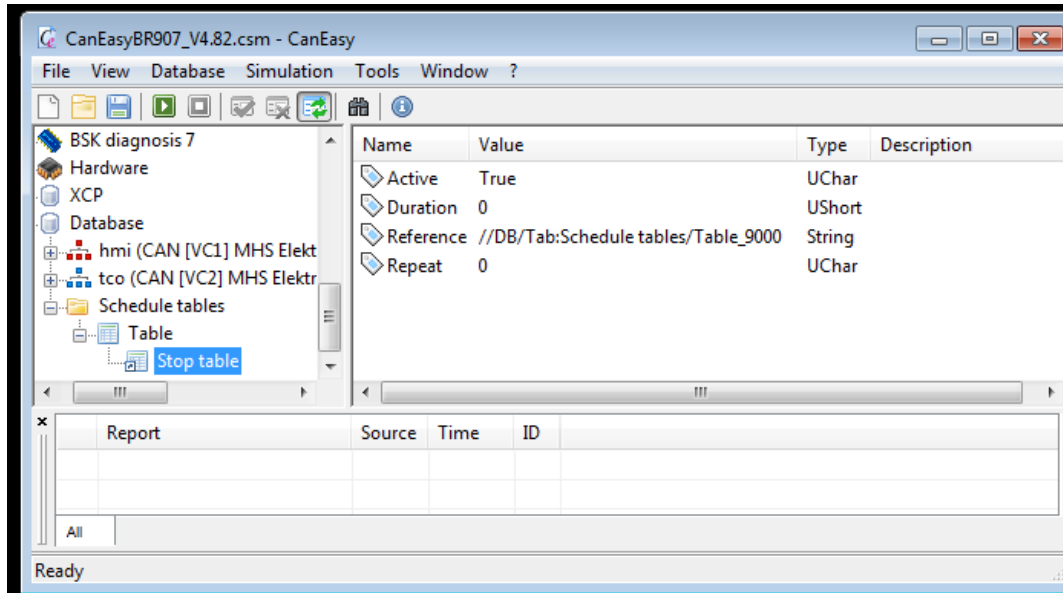
## Asynchron:

- TRUE: Starts the table in it's own thread.  
It will run in paralell to the first one
- FALSE: Waits with the execution of the current table until  
the referenced table is finished



# Table action: Stop table

Function: Stops the execution of a table



Parameters:

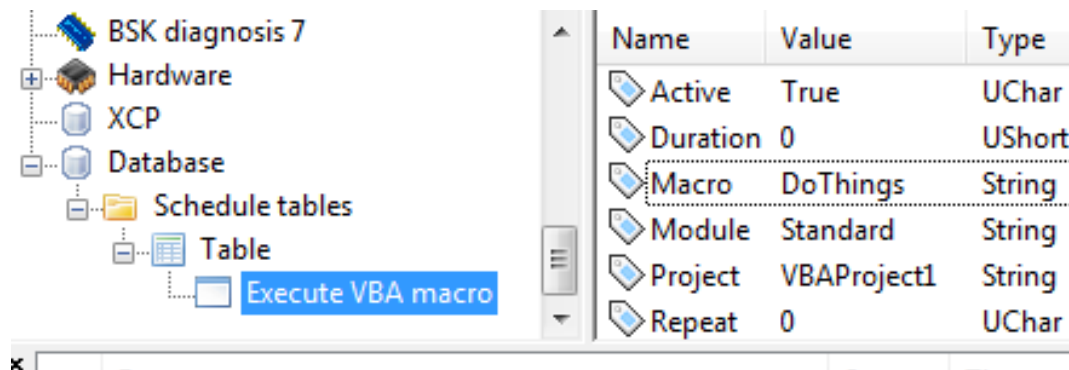
Reference:

Path of the table which has to be stopped



# Table action: Execute VBA macro

Function: Executes a VBA macro



- Parameters:

**Macro:** VBA macro (VBA Sub)

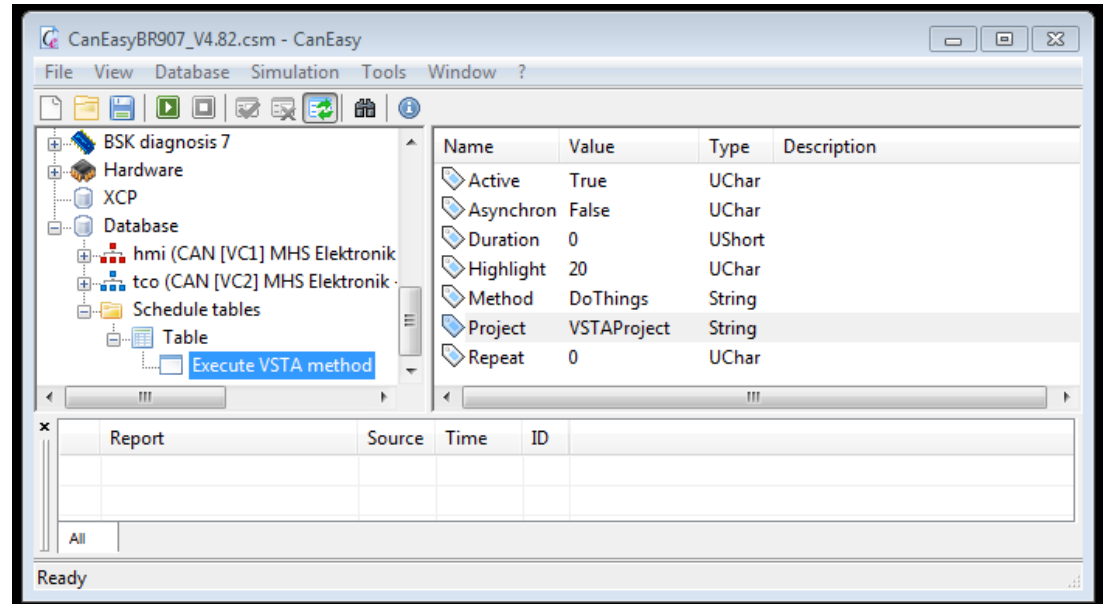
**Module:** VBA module of VBA macro

**Project:** Project of VBA module



# Table action: Execute VSTA method

Function: Executes a VSTA method



- Parameters:

**Method:** VSTA Method

**Project:** Project of VSTA Method

**Asynchron:** -TRUE: Starts macro in it's own thread

-FALSE: Waits with the execution of the current table until the macro is finished



# Table action: Execute application

Function: Executes a application via the command line

Active	True	UChar
Directory	C:\	String
Duration	0	UShort
File	test.bat	String
Parameter	argument1,argument2	String
Repeat	0	UChar

**Parameters:**

**File:** Filename

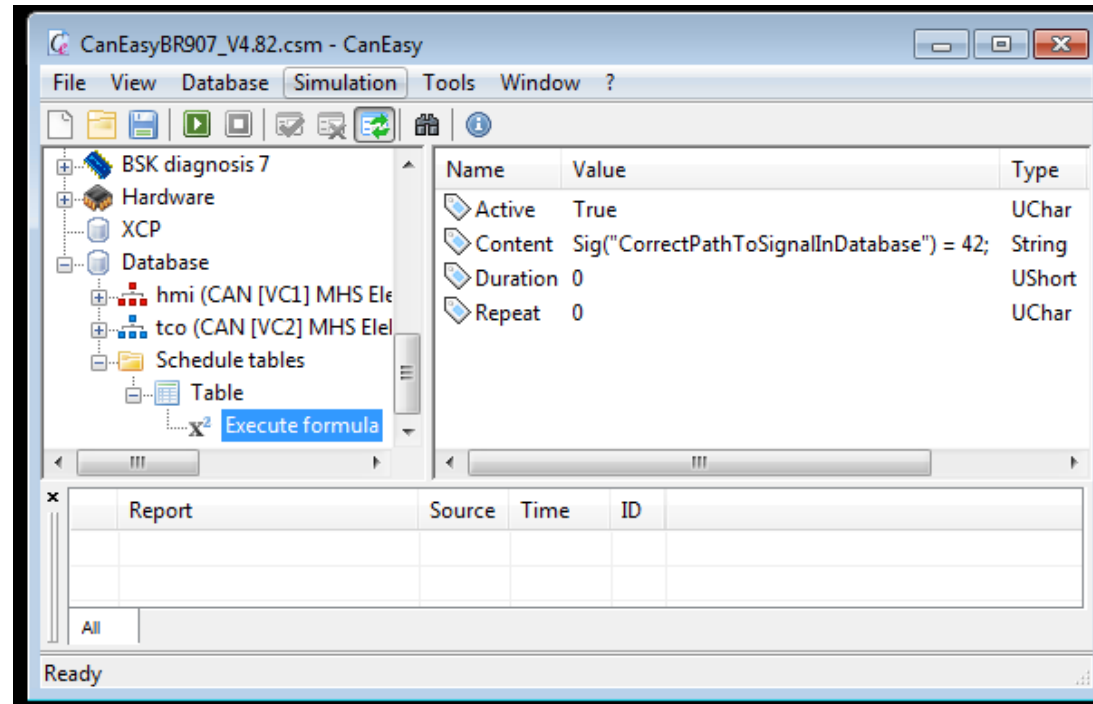
**Directory:** Directory of File

**Parameter:** Command-line arguments, comma separated



# Table action: Execute formula

Function: Executes a formula to do some calculations



Parameters:

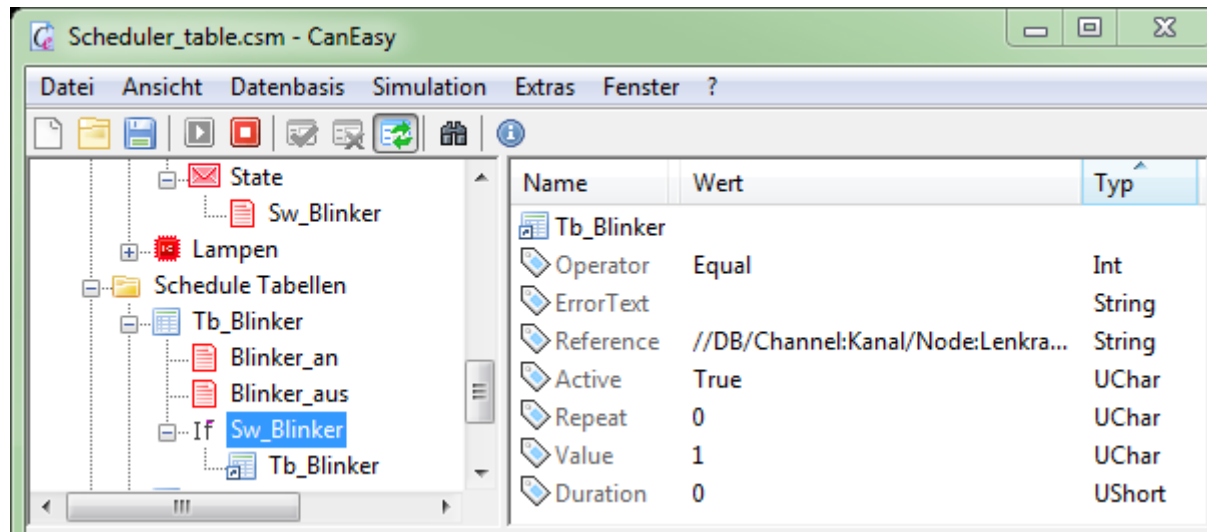
## Content:

String which contains the formula. The syntax is the same as for the Formula plugin. So the formula can be edited and tested in the Formula plugin and then copied into the table action.



# Table action: (If) Condition

**Function:** If the condition is true, the actions underneath the “If” action are executed



## Parameters:

Reference: Path to a “value” which should be compared

Value: Value which is compared to the referenced value

Operator: Comparison operator (equal, not equal, smaller, larger)



# Table action: Set value

**Function:** Sets the data of a referenced object to a value

Active	True	UChar
Duration	0	UShort
Reference	//DB/Channel:hmi/Node:TGW/Msg:TrafficInfo_AR/Sig:TrafficInfo_Stat5	String
Repeat	0	UChar
ValueToSet	NO_TRAFFIC_FLOW	UChar

Parameters:

## Reference:

Path to signal, attribute, variable, ...

## ValueToSet:

Values which is set to the reference object.

If the reference is invalid „ValueToSet“ will be invisible!

If a Value Table is assigned to the referenced object the synonyms are visible in the edit box.



# Table action: Send request

Name	Value	Type
Active	True	UChar
Duration	0	UShort
ExecuterMode	ReplaceExecuterIfActive	UChar
Reference	//DB/Channel:hmi/Node:TGW/Msg:TrafficInfo_AR/Sig:TrafficInfo_Stat4	String
Repeat	0	UChar

- Parameters:

## Reference:

-String reference of signal values, attributes or variables

## ExecuterMode:

-An executer is the executer of the reference (which can be e.g. the **transmission control**)

-Option [ReplaceExecuterIfActive]

-> The new executer will be temporary the table (until the table has been executed)

-> When the table has been executed, then the old executer will become the executer of the reference again

-Option [ReplaceExecuter]

-> The new executer is the table

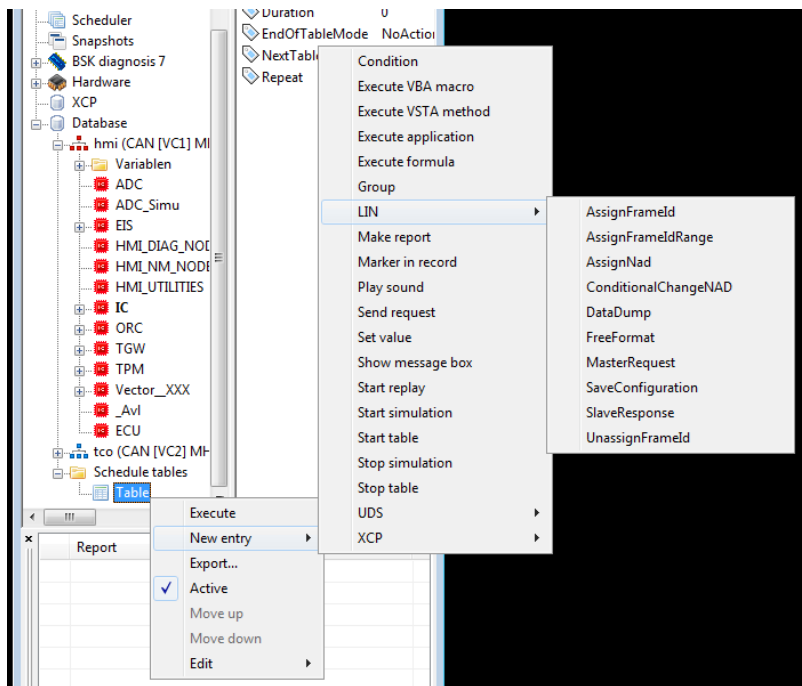
-> The old executer will be forgotten forever (It can not send anymore)

-Option [KeepExecuter]

-> The old executer will be kept, but may impact the process



# Table action: LIN ->...



- AssignFrameId
- AssignFrameIdRange
- AssignNad
- ConditionalChangeNAD
- DataDump
- FreeFormat
- MasterRequest
- SlaveConfiguration
- SlaveResponse
- UnassignFrameId



# Table action: UDS ->...

Possible table entries:

- Diagnosis request
- Read DTC
- ReadByAdress
- ReadByIdentifier
- Reset
- SecurityAccess
- TesterPresent
- WriteByAdress
- WriteByIdentifier



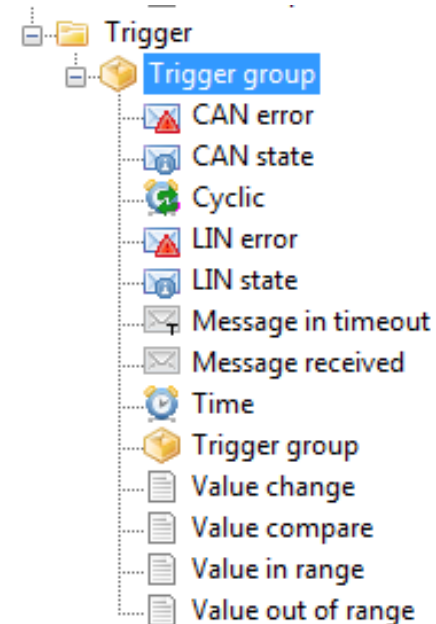
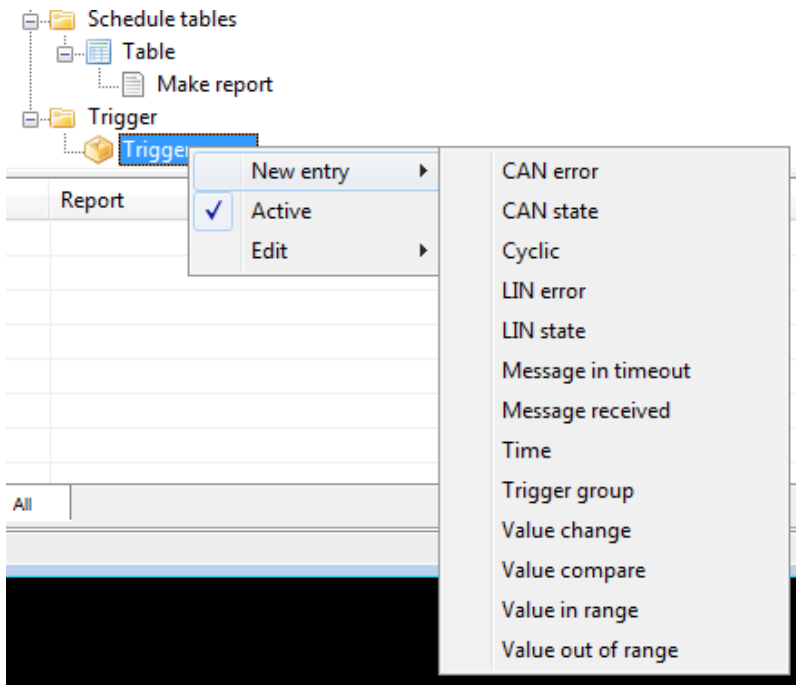
# Table action: XCP ->...

- Possible table entries:
  - Data read
  - Data write



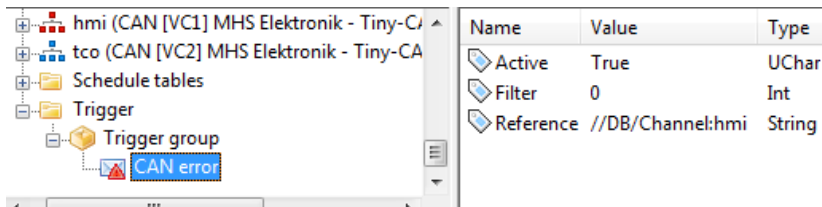
# Trigger: Overview

## ■ List of trigger:





# Trigger: Common parameter



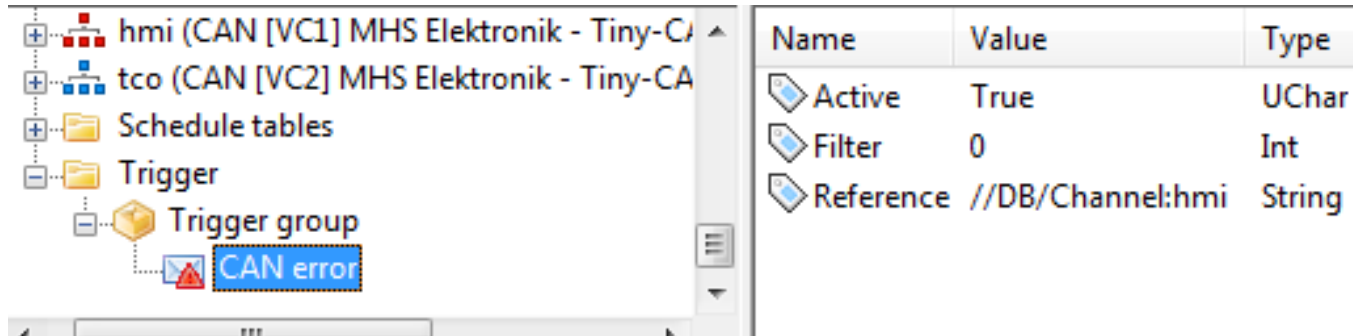
- Each **trigger** has at least the following parameter:

## Active:

Can be used to  
activate/deactivate **trigger**



# Trigger: CAN error



Name	Value	Type
Active	True	UChar
Filter	0	Int
Reference	//DB/Channel:hmi	String

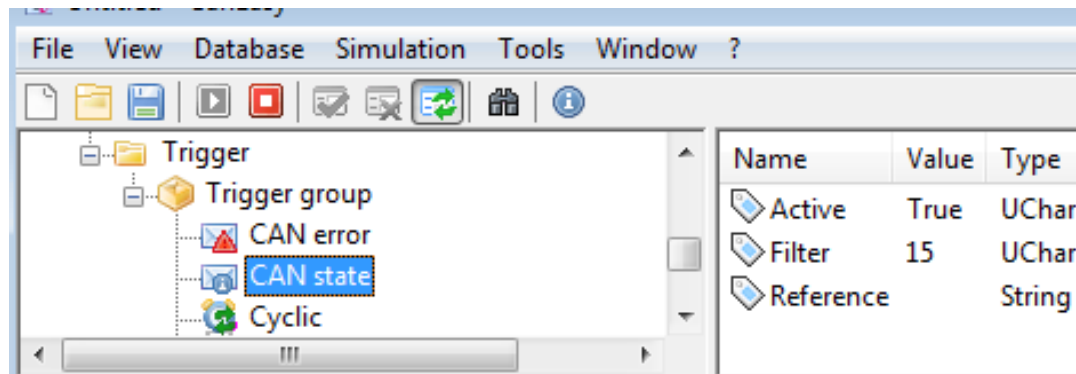
- Parameters:

## Reference:

Path of a CAN channel



# Trigger: CAN state



- Parameters:

## Reference:

String reference of a CAN channel

## Filter:

-Defines a bitmask for chipstate/CAN state

-Possible Values:

- [1] -> Bus off
- [2] -> Passive
- [4] -> Warning
- [8] -> Active



# Trigger: Cyclic



- Functions:
  - Trigger executes cyclic repetitions
  - First execution after time elapsed

- Parameters:

**Time:**

Time in ms



# Trigger: LIN error

- Parameters:

## Reference:

Path of a LIN channel

## Filter:

-Defines a bitmask for LIN state

-Possible Values:

[1] -> No Answer

[2] -> Sync Error

[4] -> Error msg

[8] -> CRC error



# Trigger: LIN state

- Parameters:

## Reference:

Path of a LIN channel

## Filter:

- Defines a bitmask for LIN error
- Possible Values:
  - [0] -> Unknown
  - [1] -> Wakeup
  - [2] -> Sleep



# Trigger: Message in Timeout

- Parameters:

## Reference:

Path of a message

## Timeout:

Timeout in ms

---



# Trigger: Time

- Parameters:

## Time:

Time in ms since the simulation has been started



# Trigger: Value change

- Parameters:

## Reference:

Path of an object with values



# Trigger: Value in range

- Parameters:

## Reference:

Path of an object with values

## LowerBound:

Bound where the trigger will execute an action

## UpperBound:

Bound where the trigger will execute an action

---



# Trigger: Value out of range

- Parameters:

## Reference:

Path of an object with values

## LowerBound:

Bound where the trigger will execute an action

## UpperBound:

Bound where the trigger will execute an action

---



# Trigger: Value compare

- Parameters:

## Reference:

- Is the first operand
- Path, e.g. Message: TrafficInfo

## Operator:

- Connects „Reference“ with „Value“
- Possible values: Equal, Not equal, Smaller, Larger

## Value:

- Is the second operand
  - Has to be a valid value of „Reference“, e.g. HEAVY\_TRAFFIC
  - Valid values will be automatically displayed in a dropdown menu if „Reference“ was valid
-



Thank you for your attention!

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