

DIView

Historical variables

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Outline

- History Overview
- Database Configuration
- Variable record Configuration
- History group record Configuration
- Script

Purpose

After this chapter, you will learn ...

- ... Historical database configuration
- ... Variable record configuration and script
- ... Historical group record configuration and script

- Various data will be generated when the project is running.
- These data are very valuable for users to understand the production status and historical status.

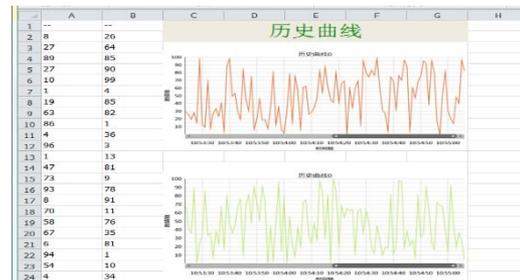
The historical record function provides the recording and query of these data.

- Support variable records and historical group records;
- Various storage modes: timing record, change record, general storage, difference storage;
- Built-in timer to achieve flexible and convenient storage and query interval;
- Support My SQL, SQL Server, SQL Compact, Oracle and other different databases;
- Support the display of diverse historical records such as reports and historical curves;

DIAView



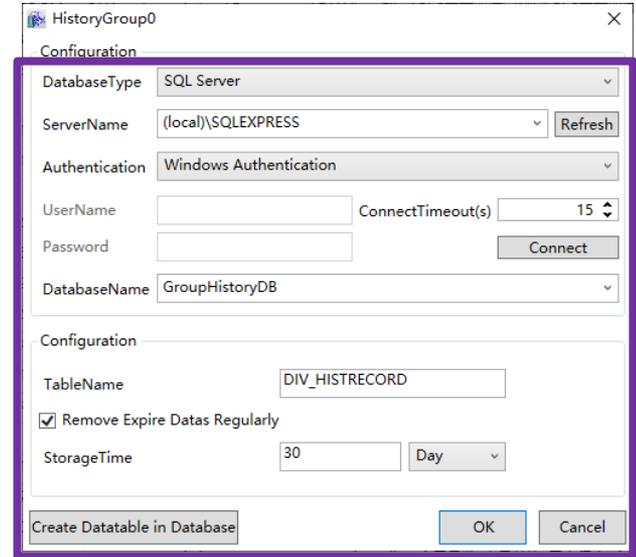
Database



Database Configuration

- The data of the historical record is stored in the specified Database. Before the historical record starts, the variable record and the historical group record need to be configured with the Database.

- **DatabaseType:** Data source type, variable records support SQL Server, and history record group support SQL Server Compact \ SQL Server \ Oracle \ My SQL
- **ServerName:** The name or IP address of the database server to be connected, click the drop-down button will automatically search the server in the network
- **Authentication:** There are two authentication methods: Windows Authentication, SQL Authentication
- **Connect:** Connection test to test whether it can connect to the database server
- **DatabaseName:** Database name to be used
- **TableName:** Name of the data table to be used
- **Create Datable in Database:** After clicking this button, DIAView constructs a table in Database according to the configuration of Database



The screenshot shows the 'HistoryGroup0' configuration window. The 'DatabaseType' is set to 'SQL Server'. The 'ServerName' is '(local)\SQLEXPRESS'. The 'Authentication' is 'Windows Authentication'. The 'ConnectTimeout(s)' is set to 15. The 'DatabaseName' is 'GroupHistoryDB'. The 'TableName' is 'DIV_HISTRECORD'. The 'Remove Expire Datas Regularly' checkbox is checked. The 'StorageTime' is set to 30 days. There are buttons for 'Refresh', 'Connect', 'Create Datable in Database', 'OK', and 'Cancel'.

Record Variable configuration

① **Timing mode example:** How to set up a RecordVariable record every 2 sec.

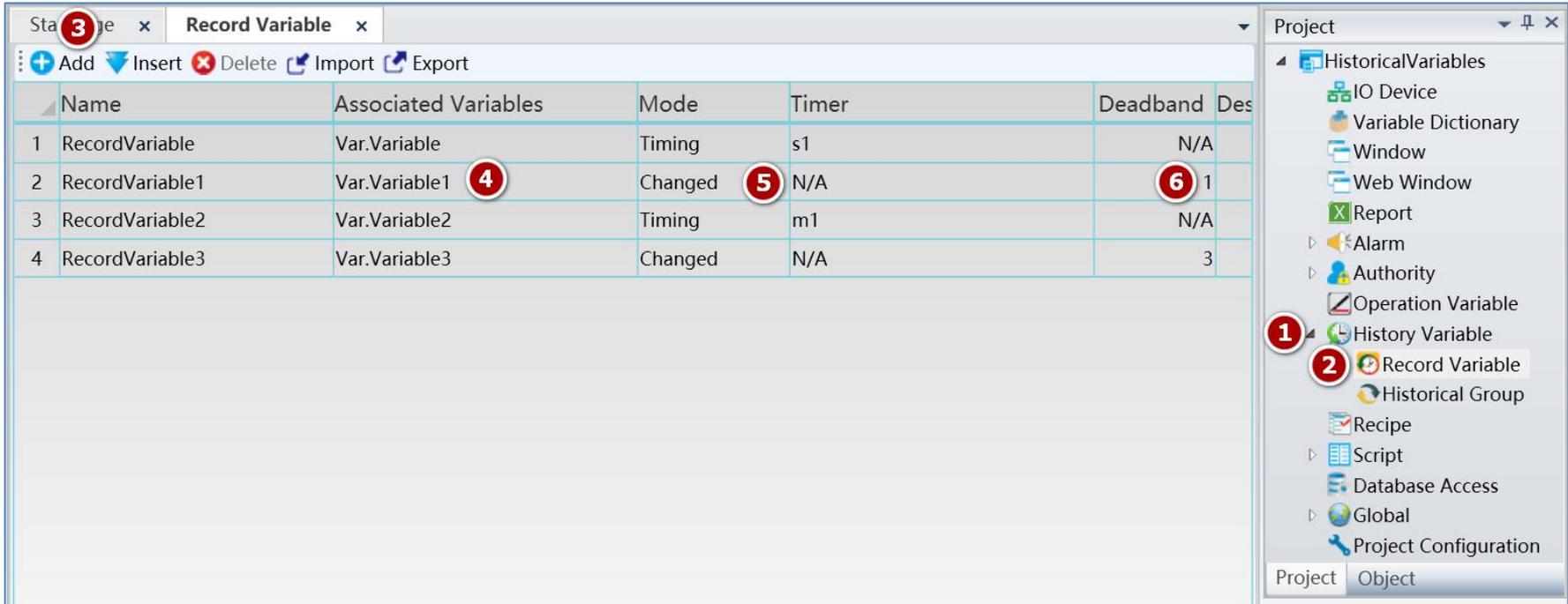
The screenshot shows the 'Record Variable' configuration window. The main table lists variables with their associated variables, modes, timers, and deadbands. A 'Timer Browser' dialog is open, showing a list of timers with their units and coefficients. Red circles with numbers 1 through 7 highlight specific elements: 1 points to 'Record Variable' in the project tree, 2 points to the 'Record Variable' icon in the tree, 3 points to the 'Stage' tab, 4 points to 'Var.Variable' in the table, 5 points to 'Timing' in the table, 6 points to 's2' in the table, and 7 points to the 'Timer Browser' dialog.

Name	Associated Variables	Mode	Timer	Deadband	Description
1 RecordVariable	Var.Variable	Timing	s2	N/A	
2 RecordVariable1	Var.Variable1	Changed	N/A	0	
3 RecordVariable2	Var.Variable2	Timing	m1	N/A	
4 RecordVariable3	Var.Variable3	Changed	N/A	200	

IsEnable	Name	Timer Unit	Timer Coefficient	Relative Time	Description
<input checked="" type="checkbox"/>	s2	Second	2	0001-01-01 00:00:00	Triggers every second
<input type="checkbox"/>	s10	Second	10	0001-01-01 00:00:00	Triggers every 10 seconds
<input type="checkbox"/>	s30	Second	30	0001-01-01 00:00:00	Triggers every 30 seconds
<input type="checkbox"/>	m1	Minute	1	0001-01-01 00:00:00	Triggers every minute
<input type="checkbox"/>	m30	Minute	30	0001-01-01 00:00:00	Triggers every 30 minutes
<input type="checkbox"/>	h1	Hour	1	0001-01-01 00:00:00	Triggers every hour

Record Variable configuration

② **Changed mode example:** How to set up a RecordedVariable record in changed mode?



The screenshot displays the 'Record Variable' configuration window. The main table contains the following data:

	Name	Associated Variables	Mode	Timer	Deadband	Des
1	RecordVariable	Var.Variable	Timing	s1	N/A	
2	RecordVariable1	Var.Variable1	Changed	N/A	1	
3	RecordVariable2	Var.Variable2	Timing	m1	N/A	
4	RecordVariable3	Var.Variable3	Changed	N/A	3	

The right-hand 'Project' tree shows the following structure:

- HistoricalVariables
 - IO Device
 - Variable Dictionary
 - Window
 - Web Window
 - Report
 - Alarm
 - Authority
 - Operation Variable
 - History Variable
 - Record Variable
 - Historical Group
 - Recipe
 - Script
 - Database Access
 - Global
 - Project Configuration

Red circles 1 and 2 highlight the 'History Variable' and 'Record Variable' items respectively in the tree. Red circles 3, 4, 5, and 6 highlight the 'Record Variable' tab, the 'RecordVariable1' row, the 'Changed' mode, and the '1' deadband value in the table.

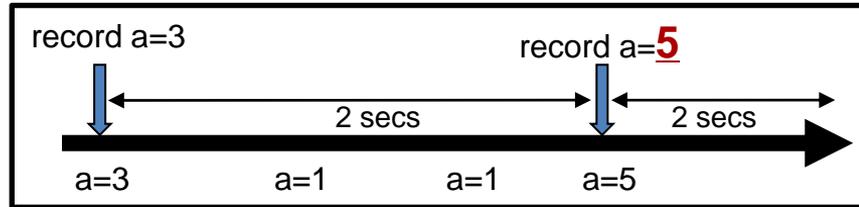
History group configuration

➤ The historical group record records historical variables in groups, and each group can be associated with up to 256 variables.

- Storage method:

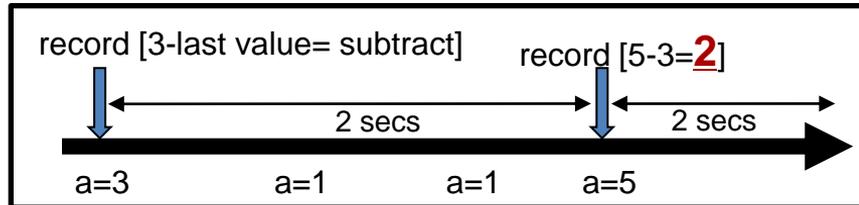
① **General storage**: record real-time data generated by variables;

- Time trigger
- Time unit = 2 sec



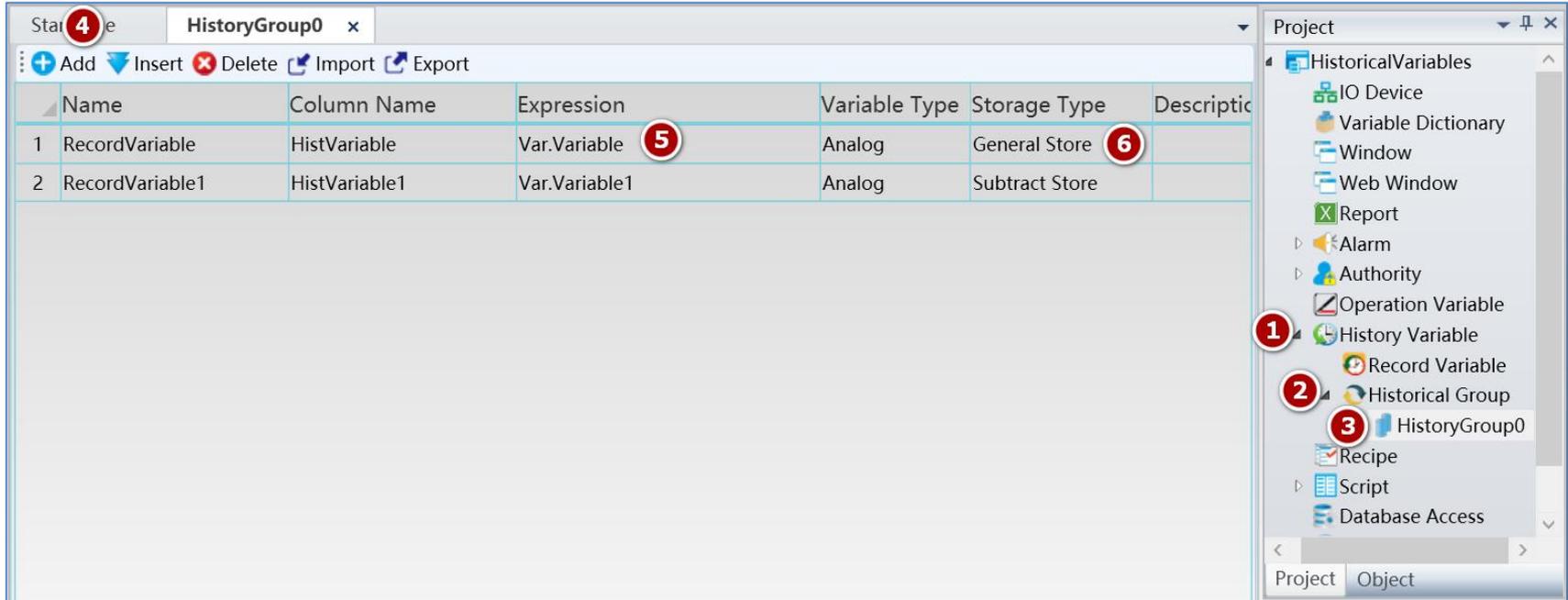
① **Subtract storage**: record the difference between the data generated by the variable and the last data

- Time trigger
- Time unit = 2 sec



Record Variable configuration

① General storage.



Star **4** e HistoryGroup0 x

+ Add - Insert x Delete Import Export

	Name	Column Name	Expression	Variable Type	Storage Type	Description
1	RecordVariable	HistVariable	Var.Variable 5	Analog	General Store 6	
2	RecordVariable1	HistVariable1	Var.Variable1	Analog	Subtract Store	

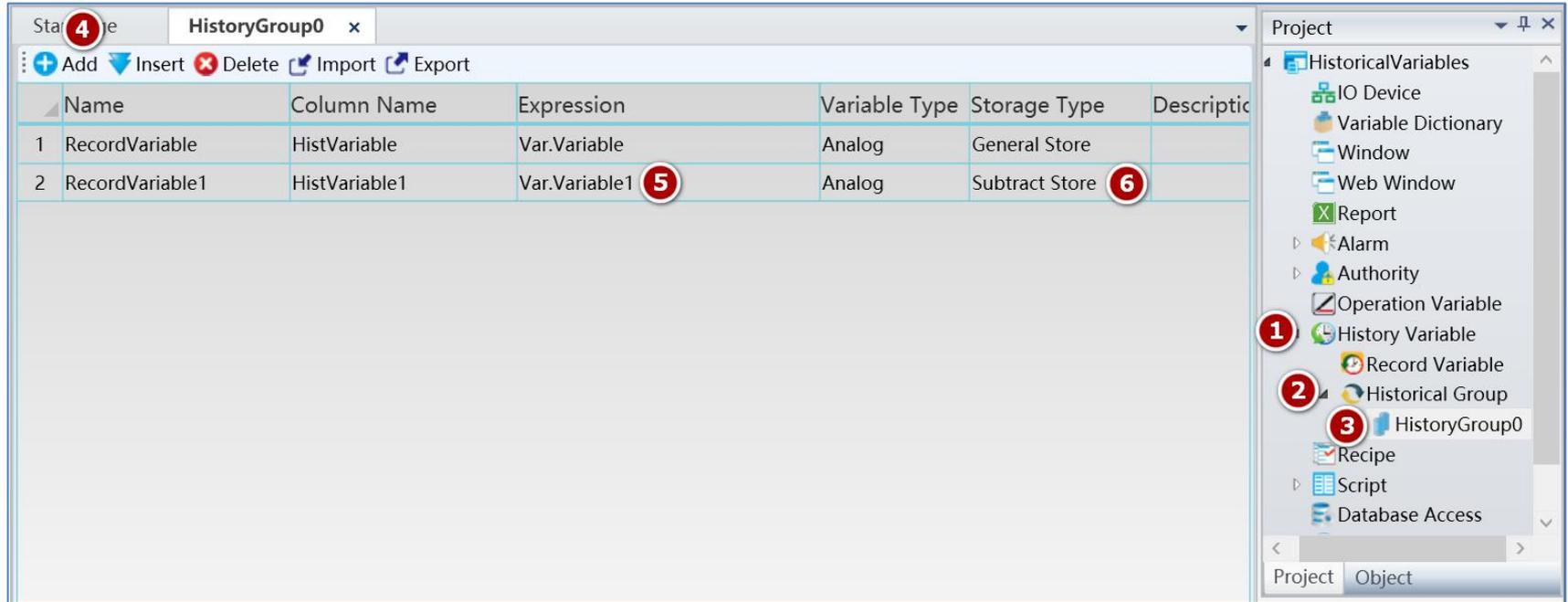
Project

- HistoricalVariables
 - IO Device
 - Variable Dictionary
 - Window
 - Web Window
 - Report
 - Alarm
 - Authority
 - Operation Variable
 - 1** History Variable
 - 2** Record Variable
 - 3** Historical Group
 - HistoryGroup0
 - Recipe
 - Script
 - Database Access

Project Object

Record Variable configuration

② Subtract storage :



4

HistoryGroup0 x

... Add Insert Delete Import Export

	Name	Column Name	Expression	Variable Type	Storage Type	Description
1	RecordVariable	HistVariable	Var.Variable	Analog	General Store	
2	RecordVariable1	HistVariable1	Var.Variable1	Analog	Subtract Store	

1

2

3

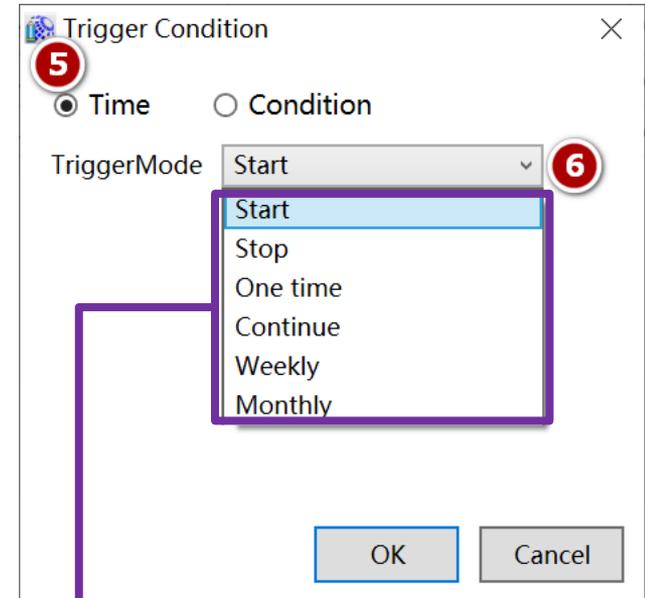
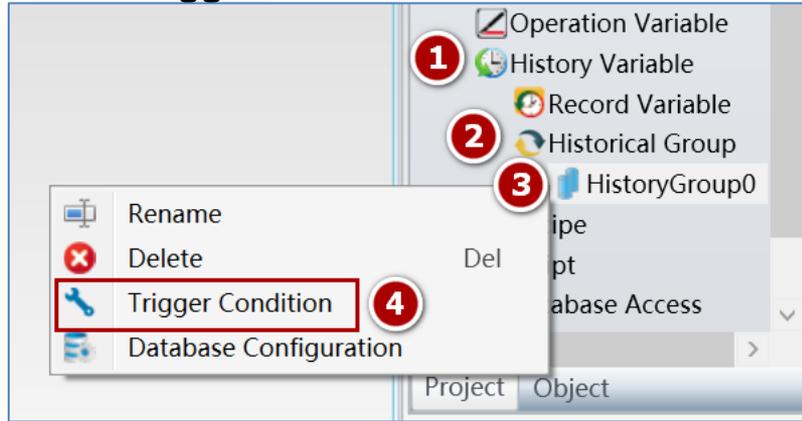
Project

- HistoricalVariables
 - IO Device
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 - Window
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 - Script
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Project Object

Record Variable configuration

① Time Trigger:

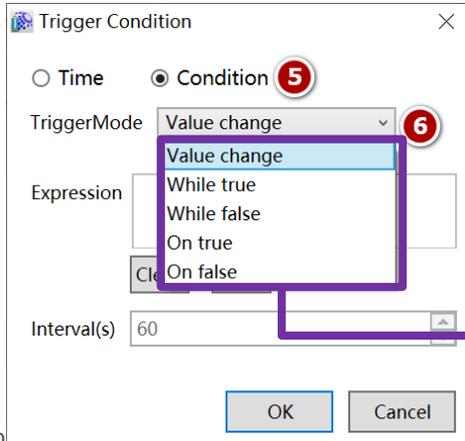
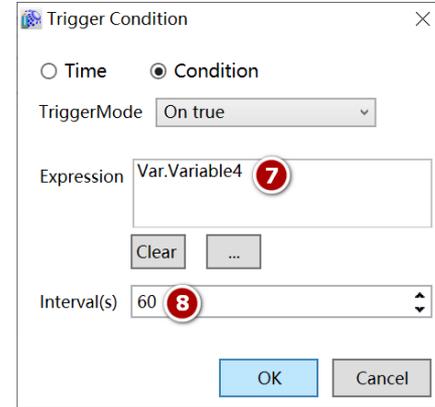
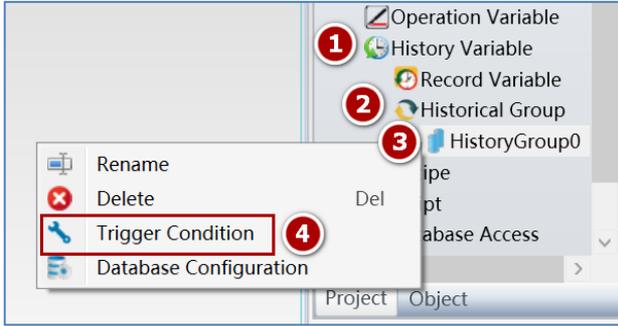


Start	Record a piece of data at startup
Stop	Record a piece of data when stopped
One time	Record a piece of data at a fixed time
Continue	Record data continuously
Weekly	Record data continuously every week
Monthly	Record data continuously every month

Record Variable configuration

➤ There are two method to trigger:

② **Condition Trigger:**

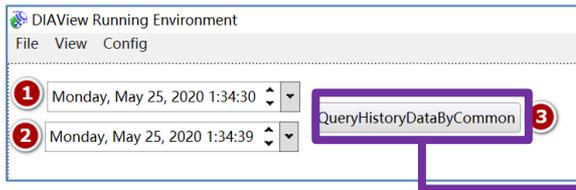


Value change	Triggered when the expression value changes
While true	Triggered when the expression value changes to true
While false	Triggered when the expression value changes to false
On true	Triggered when the expression value remains true
On false	Triggered when the expression value remains false
Value change	Triggered when the expression value changes

Example 1:

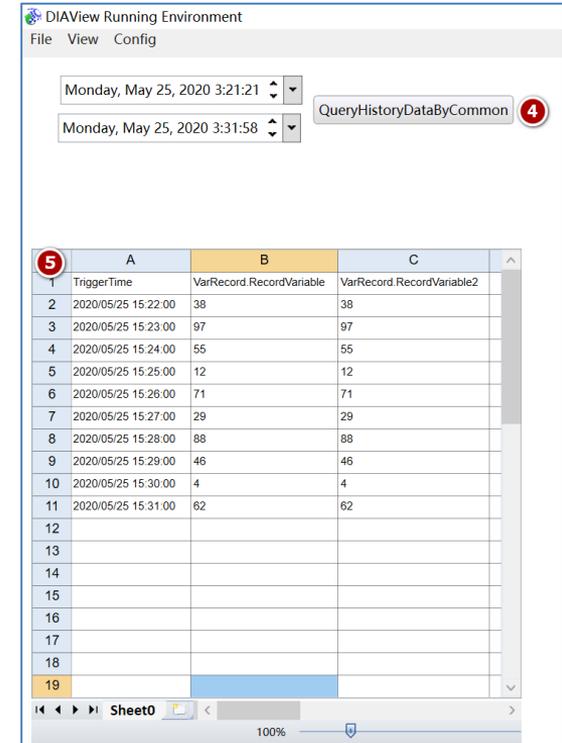
The variable record is read through the script and displayed in the report.

- QueryHistoryDataByCommon(sheetIndex, conditions, types): variable record query
 - sheetIndex: worksheet index
 - conditions: Variable record collection, separated by commas
 - types: TriggeringTime, Value, can also be replaced with 0 and 1 respectively



```

DateTimePicker0.Value = Sys.StartTime
DateTimePicker1.Value = Sys.Now
Call Report0.SetWorkSheetStartTime(0,DateTime
Picker0.ValueTime)
Call Report0.SetWorkSheetEndTime(0,DateTIme
Picker1.ValueTime)
Call Report0.SetVarRecordRuleName(0,"m1")
Call Report0.QueryHistoryDataByCommon(0,"Var
Record.RecordVariable,VarRecord.RecordVariabl
e,VarRecord.RecordVariable2",0,1,1")
    
```



The screenshot shows the DIAView Running Environment interface displaying a report table. The table has 3 columns: A, B, and C. The data is as follows:

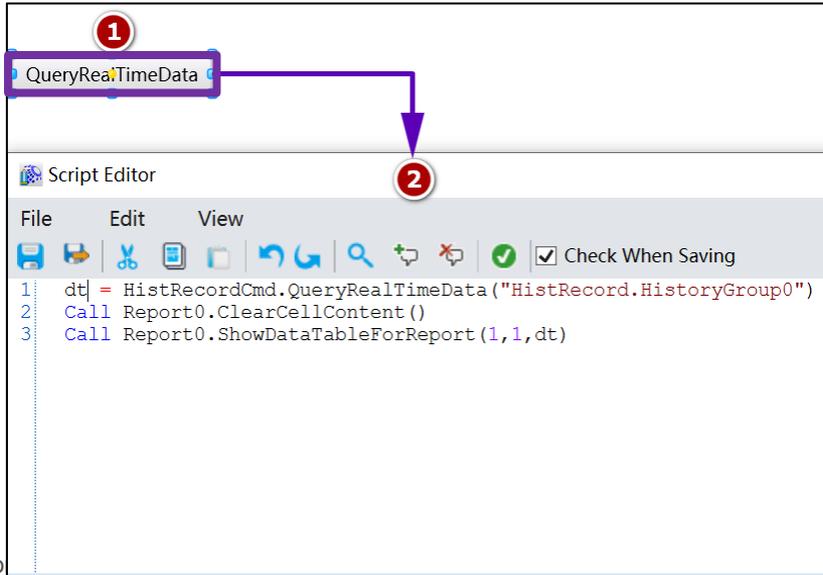
5	A	B	C
1	TriggerTime	VarRecord.RecordVariable	VarRecord.RecordVariable2
2	2020/05/25 15:22:00	38	38
3	2020/05/25 15:23:00	97	97
4	2020/05/25 15:24:00	55	55
5	2020/05/25 15:25:00	12	12
6	2020/05/25 15:26:00	71	71
7	2020/05/25 15:27:00	29	29
8	2020/05/25 15:28:00	88	88
9	2020/05/25 15:29:00	46	46
10	2020/05/25 15:30:00	4	4
11	2020/05/25 15:31:00	62	62
12			
13			
14			
15			
16			
17			
18			
19			

Query history group record script

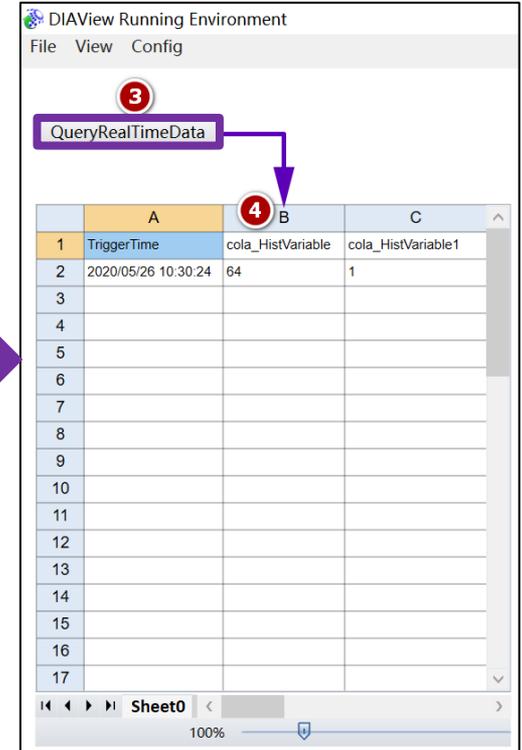
➤ Example 2:

Read the real-time data of the historical record group through the script and display it with the report.

- QueryRealTimeData: query real-time data of historical record group;



```
1 dt = HistRecordCmd.QueryRealTimeData("HistRecord.HistoryGroup0")
2 Call Report0.ClearCellContent()
3 Call Report0.ShowDataTableForReport(1,1,dt)
```



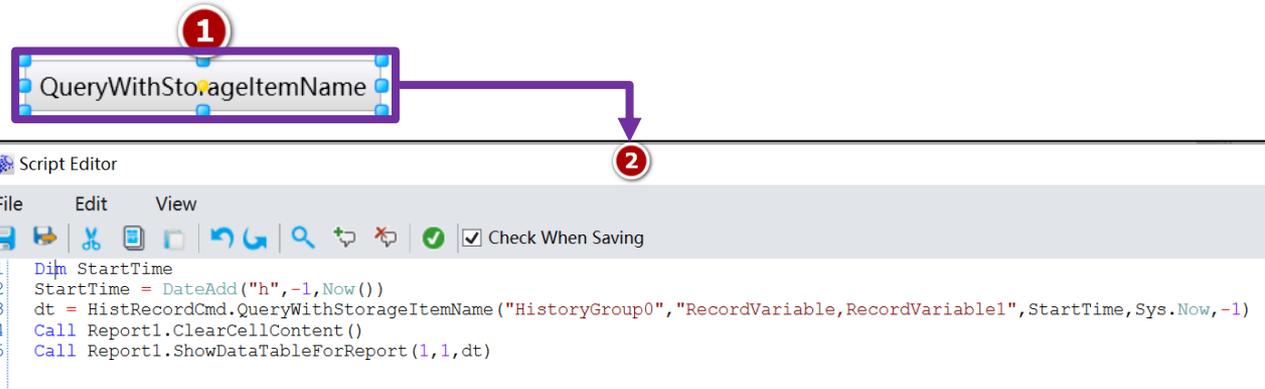
	A	B	C
1	TriggerTime	cola_HistVariable	cola_HistVariable1
2	2020/05/26 10:30:24	64	1
3			
4			
5			
6			
7			
8			
9			
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17			

Query history group record script

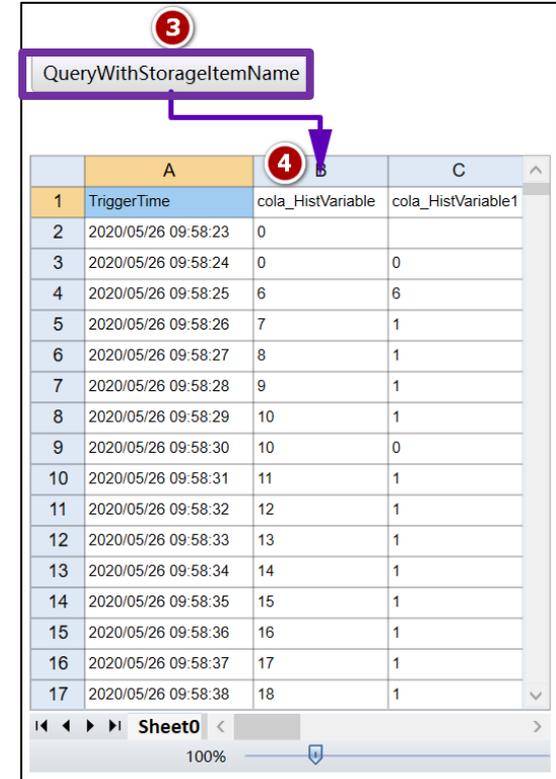
➤ Example 3:

Read the historical record group data through the script and display it with the report.

- QueryWithStorageItemName: Query historical record group data, the example is to query the data of the last hour;
- Use the DateAdd function to set the query time range to the past hour;



```
1 Dim StartTime
2 StartTime = DateAdd("h",-1,Now())
3 dt = HistRecordCmd.QueryWithStorageItemName("HistoryGroup0", "RecordVariable",RecordVariable1",StartTime, Sys.Now,-1)
4 Call Report1.ClearCellContent()
5 Call Report1.ShowDataTableForReport(1,1,dt)
```



	A	B	C
1	TriggerTime	cola_HistVariable	cola_HistVariable1
2	2020/05/26 09:58:23	0	
3	2020/05/26 09:58:24	0	0
4	2020/05/26 09:58:25	6	6
5	2020/05/26 09:58:26	7	1
6	2020/05/26 09:58:27	8	1
7	2020/05/26 09:58:28	9	1
8	2020/05/26 09:58:29	10	1
9	2020/05/26 09:58:30	10	0
10	2020/05/26 09:58:31	11	1
11	2020/05/26 09:58:32	12	1
12	2020/05/26 09:58:33	13	1
13	2020/05/26 09:58:34	14	1
14	2020/05/26 09:58:35	15	1
15	2020/05/26 09:58:36	16	1
16	2020/05/26 09:58:37	17	1
17	2020/05/26 09:58:38	18	1

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