

# Application Note

## [NOTE] How to Set Up Semi-Quantitative Data?

[AN] RTV-2023-0214-001



### Application:

In the context of rapid test kits, utilizing the concept of semi-quantitative analysis means that results can be relatively quantified based on their intensity or degree, rather than simply being classified as positive or negative.

By using a rapid test reader, the analysis results of the test kit can be represented in the following formats:

1. Positive/Negative determination.
2. Customized result interpretation.
3. Conversion of the intensity of the test reactivity to relative concentration results using a standard curve.
4. Representation of composite results.

These results can be categorized into different levels or intervals, which can be determined based on the characteristics of the test kit and the desired level of result interpretation accuracy.

### Product:

RapidScan Lateral Flow Readers Pro with Rapid Test View or Rapid Test View\_Ethernet Software (RTV&ERTV for short)

### Introduction:

1. The **Quantitative Mapping Curve** function of **Modify Lot** can convert the value measured by the **T Band** into the **actual concentration**, and the purpose is to set the quantitative conversion.

A screenshot of the 'Quantitative Mapping Curve' software interface. The window title is 'Quantitative Mapping Curve'. It contains several input fields and controls: 'Bias' is set to 0; 'Result Significant Digits' is a dropdown menu set to 5; 'Result Formula' is 'T1' and 'Single' is a dropdown menu; 'Concentration' has two input fields, both set to 0.00, with 'Read' and 'Add' buttons between them. Below these are 'Curve' (set to 'Interval Linear'), 'Log', and 'Reset' buttons. At the bottom is a section for '4PL Parameters' with 'Working Range: Concentration' set to 0.000000 - 0.000000, and parameters 'a', 'b', 'c', and 'd' all set to 0.000000.

- The **Qualitative Statement** function of **Modify Lot**, through the **formula**, can convert the original T value or concentration value into **qualitative**, **quantitative**, or **semi-quantitative** results.

Qualitative Statement

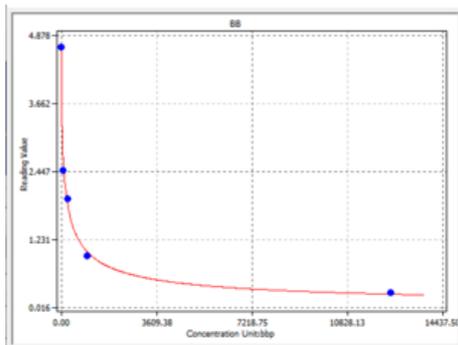
Statement:

Formula:

Result Text:  Text 2:

- How To Set Mix Of Qualitative/Quantitative Statement:

- Using "Statement" to show the quantitative value @ working range



Qualitative Statement

Statement:

Formula:

Result Text:

Qualitative Statement

Statement:

Formula:

Result Text:

Special Mark for the variation of T1, T2, ..., C, T1\_RESULT, T1\_CONCENTRATION, ...

Qualitative Statement

Statement:

Formula:

Result Text:

**Example:**

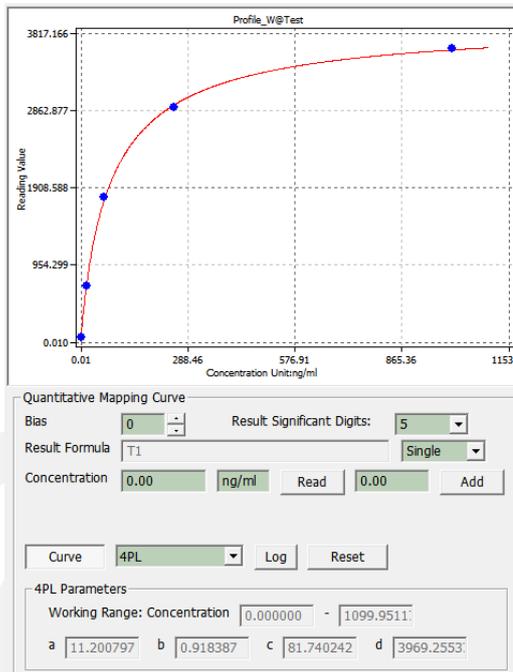
Assume that the condition and result relationship we expect to output is as follows:

formula	result
lower than 1.953 ng/ml	"<1.953 ng/ml "
between 1.953 ng/ml and 250 ng/ml	Display exact value in ng/ml
higher than 250 ng/ml	"hook effect"

**1. Quantitative Mapping Curve Setting:**

- Complete the **Profile Wizard** setting of the product.

- B. Through the above Profile, use the Reader to analyze samples with different concentrations, and then use the **Quantitative Mapping Curve** function to create a standard curve.



ng/mL	COVID-19(T1)
1000.000	3509
250.000	2893
62.500	1786
15.625	692
0.488	57

--> For details about standard curve operations, please refer to **Using Modify Lot To Set Analysis Formula For Obtaining Result** in [\(E\)RTV User Manual](#).

## 2. **Qualitative Statement Setting:**

	Condition	result
a	lower than 1.9 ng/ml	"<1.9 ng/ml "
b	between 1.9 ng/ml and 250 ng/ml	Display exact value in
c	higher than 250 ng/ml	"Over the range"

Qualitative Statement settings:

Formula a:

The 'Qualitative Statement' settings panel shows the following configuration: Statement is set to '<1.9 ng/ml', Formula is 'T1\_CONCENTRATION < 1.9', and Result Text is '<1.9 ng/ml'. There is a 'Clear' button next to the Statement field and a 'Text 2' field which is currently empty.

Formula b:

Qualitative Statement

Statement: **CONCENTRATION**

Formula:  $T1\_CONCENTRATION \geq 1.9 \& T1\_CONCENTRATION < 250$

Result Text: **\$T1\_CONCENTRATION** Text 2:

Formula c:

Qualitative Statement

Statement: **Over the range**

Formula:  $T1\_CONCENTRATION \geq 250$

Result Text: **Over the range** Text 2:

### 3. Analytical Verification:

### 4. Result description:

	T1 Value	Standard curve conversion of concentration	Eligible conditions	The results show
A	3183	372.882 ng/ml	higher than 250 ng/ml	Over the range
B	2062	87.996 ng/ml	between 1.9 ng/ml and 250 ng/ml	87.996 ng/ml
C	1208	32.999 ng/ml	between 1.9 ng/ml and 250 ng/ml	32.999 ng/ml
D	57	1.100 ng/ml	lower than 1.9 ng/ml	<1.9 ng/ml

### Extended Application:

TEXT2 function: → Currently this feature can only be displayed on the ST5 UI

Qualitative Statement

Statement: <1.9 ng/ml

Formula: T1\_CONCENTRATION < 1.9

Result Text: <1.9 ng/ml

Text 2:

You can use the TEXT2 function to additionally define a qualitative result, so that the expression of the analysis result can be more diverse. Extending Example, we can modify the Qualitative Statement Setting as follows:

	Condition	result	TEXT2
A	lower than 1.953 ng/ml	"<1.953 ng/ml "	Negative
B	between 1.953 ng/ml and 250 ng/ml	Display exact value in ppm	Positive
C	higher than 250 ng/ml	"Over the range"	Positive

### Qualitative Statement settings:

Qualitative Statement

Statement: <1.9 ng/ml

Formula: T1\_CONCENTRATION < 1.9

Result Text: <1.9 ng/ml

Text 2: Negative

Qualitative Statement

Statement: CONCENTRATION

Formula: T1\_CONCENTRATION >= 1.9 & T1\_CONCENTRATION < 250

Result Text: \$T1\_CONCENTRATION

Text 2: Positive

Qualitative Statement

Statement: Over the range

Formula: T1\_CONCENTRATION >= 250

Result Text: Over the range

Text 2:

## Analytical Verification:

Sample A	Sample B	Sample C	Sample D
2023/05/09 15:24 RTV	2023/05/09 15:32 RTV	2023/05/09 15:34 RTV	2023/05/09 15:36 RTV
Item: Profile_W5@Test Species: Feline Pet: Lucky Patient ID: 2299			
<b>Over the range</b>	<b>87.99616 ng/ml</b>	<b>32.99853 ng/ml</b>	<b>&lt;1.9 ng/ml</b>
	Positive	Positive	Negative
Export reports to USB			
>> Next measurement	>> Next measurement	>> Next measurement	>> Next measurement

## Result description:

	T1 Value	Standard curve conversion of concentration	Eligible conditions	The results show	Test2 show
A	3183	372.882 ng/ml	higher than 250 ng/ml	Over the range	(blank)
B	2062	87.996 ng/ml	between 1.9 ng/ml and 250 ng/ml	87.996 ng/ml	Positive
C	1208	32.999 ng/ml	between 1.9 ng/ml and 250 ng/ml	32.999 ng/ml	Positive
D	57	1.100 ng/ml	lower than 1.9 ng/ml	<1.9 ng/ml	Negative