

LCD Touch Screen Modules

Touch Screen Sensitivity Adjustment Guide

Application Note

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Contents

1. Scope	- 3 -
2. Touch Setting Adjustment	- 3 -
2.1. Touch Setting Package	- 3 -
3. Sensitivity Adjustment Tool.....	- 4 -
4. Sensitivity Adjustment General Flow	- 4 -
5. Touch Setting File and Threshold Value Selection	- 6 -
5.1. Important Files	- 6 -
5.2. How to Select Proper Touch Setting File and Threshold Value	- 7 -
5.2.1. Selection Example	- 8 -
5.3. Touch Setting File and Threshold Selection Overview.....	- 10 -
5.4. Touch Setting Package Search Sheet	- 12 -
6. Touch Setting Data Registration / Threshold Value Set-up for GT-CP series Command Controlled.....	- 13 -
6.1. GTOMP How to Save and Enable Touch Setting Data.....	- 13 -
6.2. GTOMP How to Save and Enable Threshold Value	- 16 -
6.3. Memory SW setting (Required when using touch setting package data with a batch file) - 17 -	
7. Touch Setting Data Registration / Threshold Value Set-up for GT-VP series Digital Video Input	- 18 -
7.1. GT-1Pass How to Save and Activate a Touch Setting File	- 18 -
7.2. GT-1Pass How to Adjust and Save the Touch Threshold Value	- 19 -
7.3. Memory SW setting (Required when using touch setting package data with a batch file)	- 19 -
7.4. GT-1Pass Simple Touch Screen Test.....	- 20 -
8. How to Monitor Sensitivity and Optimize Threshold Value	- 21 -
8.1. Threshold Optimization Process	- 21 -
9. Reference.....	- 27 -
9.1. How to Check Touch Setting File Status (Active / Inactive)	- 27 -
9.2. Contact Information.....	- 27 -

1. Scope

This guidance document is intended to help users adjust GT touch screen sensitivity parameters via touch setting files and reach proper operation within their environment/enclosure.

2. Touch Setting Adjustment

Noritake LCD touch screen modules, at factory default settings, are designed for typical touch applications. (bare hands, thin cover glass, multi-touch, etc.) Adjusting the module's threshold value is a simple way to improve touch sensitivity in a typical environment. More information regarding threshold adjustment is available in the GT-CP and GT-VP(1P) application notes. If an application is outside of these parameters (thick gloves, water droplets on screen, etc.), then deeper touch adjustment is required. Touch setting files can access more than just threshold values to optimize touch performance for specific environmental challenges. Noritake provides a growing array of pre-set touch setting files tested for specific environments.

※Please consult customer support if the touch sensitivity adjustment via touch setting package does not improve touch performance.

NOTE: Throughout this document, we will reference the following:

- Touch setting package: The download file containing touch setting files and supporting documentation.
- Touch setting file: the binary file containing touch adjustment values.
- Touch setting data: the binary data/values within a touch setting file that will adjust numerous touch settings.

NOTE: As of the release of this document, these references are not consistent throughout all Noritake literature and websites. It is safe to assume that "Touch setting package data" refers to a touch setting file.

2.1. Touch Setting Package

The touch setting package can be downloaded from the URL below:

<https://www.noritake-itrn.jp/eng/cs/soft/39>

The touch setting package is ***Touch_setting_package_data_file_eXX.zip***
("eXX" is a revision number, revision 1 is seen as "e01")

The downloaded touch setting package zip file contains the following files:

- Touch setting file (*1):	IDxxxx.bin (located in "touch_setting_file" folder)
- Touch setting file list:	Touch_Setting_Package_data_List.csv
- Threshold value list :	Threshold_list.csv
- Touch setting package Search sheet	Touch_Setting_Package_Search_Sheet_e.xlsx
- Readme data:	Readme_e.txt
- a-apn820_eXX.pdf (*2):	This document
- Memory SW setting batch file (*1):	IDxxxx_msw.bat (located in "msw_setting" folder)
- Memory SW setting data (*1):	MSW_set_IDxxxx.bin (located in "msw_setting" folder)
- winusb_tfr_generic.exe	USB data transfer tool (located in "msw_setting" folder)

*1) "XXXX" is an identification number, No.2 is seen as "ID0002".

*2) "eXX" is a revision number, revision 1 is seen as "e01".

As of February, 2023, touch setting files are available for the LCD touch screen modules shown in the table below. If your part number is not listed, please contact [customer support](#).

GT-CP series Command Controlled	GT-VP series Digital Video Input
GTWV070C3A00PA	GTWV070VHA00P
GTWV070C3A01PA	GTWS070VHA00P
GTWV050C3A00PA	GTWV050VHB00P
GTWQ043C3A00PA	—
—	GTWX101VHB00P

Table 1: Touch Setting File Compatibility

3. Sensitivity Adjustment Tool

Tools are available that can load and save touch setting data. These tools are listed below and available on the Noritake website:

GT-CP series Command Controlled: GTOMP

GTOMP download site URL: <https://www.noritake-itron.jp/eng/cs/soft/3/>

GT-VP series Digital Video Input: GT-1Pass

GT-1Pass download site URL: <https://www.noritake-itron.jp/eng/cs/soft/6/>

Note: Screenshot images in this document are from GTOMP version 1.0.1.3 and GT-1Pass version 1.0.5.6. Other tool versions may differ from the images in this document.

Note: The tool functionalities in this document are supported at and beyond the following tool versions:

GTOMP:	Version 1.0.1.5
GT-1 Pass:	Version 1.0.5.8

4. Sensitivity Adjustment General Flow

The following flow chart describes the touch sensitivity adjustment decision process. For additional information, a “Capacitive Touch Panel Parameter Adjustment” article is included in the following application notes. Please contact a Noritake sales representative if additional support is needed.

Application Notes:

Command Control Type and Digital Video Input Type

<https://www.noritake-itron.jp/eng/cs/appnote/>

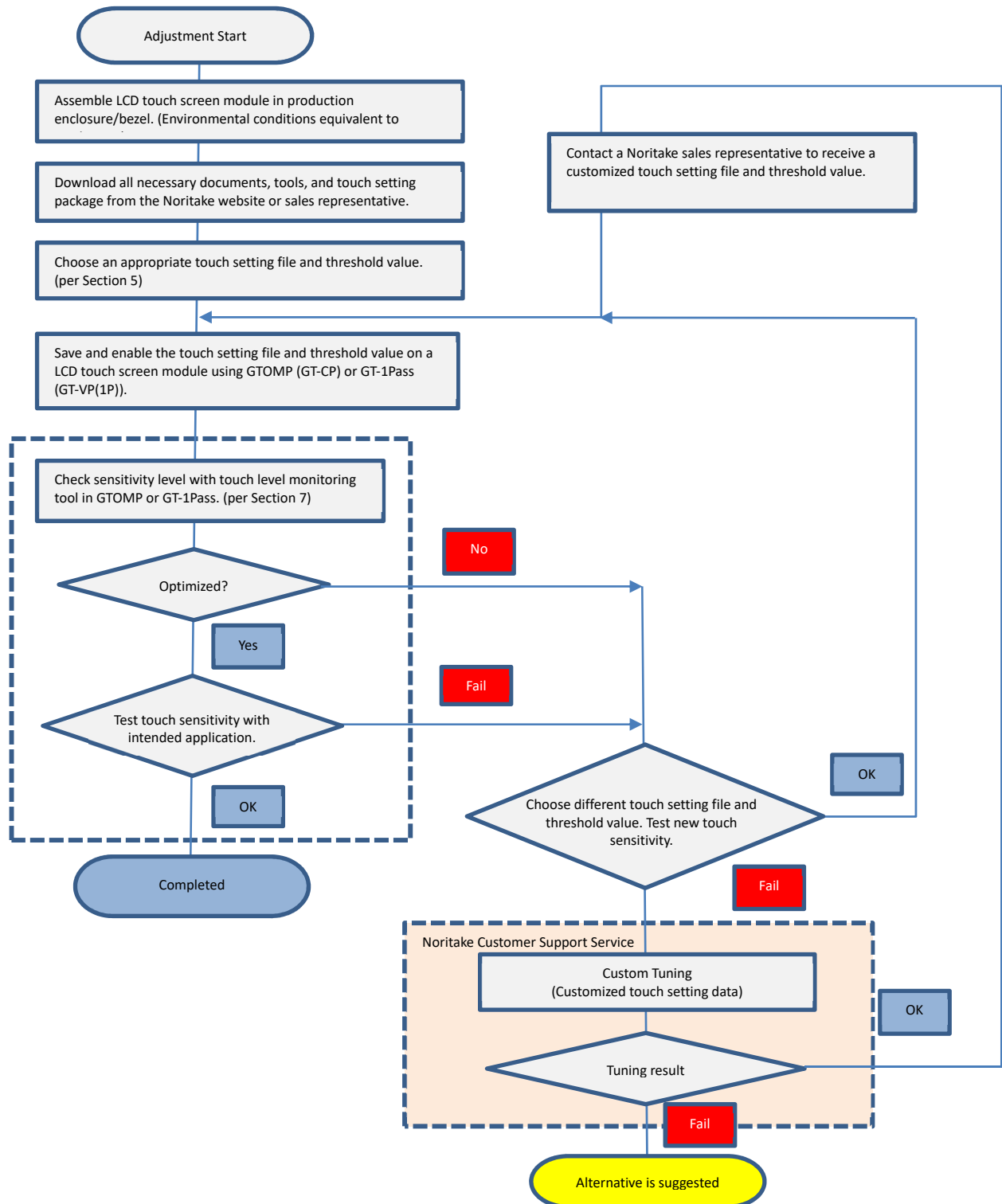


Figure 1: Sensitivity Adjustment Flow Chart

5. Touch Setting File and Threshold Value Selection

5.1. Important Files

The following files are used for selecting touch setting file and proper threshold value.

- Touch_Setting_Package_data_List.csv

Subjects	Contents
Product name	e.g. GTWV070C3A00PA
Touch setting package data file	IDxxxx.bin
ID	1 to 9999
Author	Noritake
Remarks	e.g. DRY, WET1
Touches	e.g. 10, 1 only

Table 2: Touch_Setting_Package_data_List.csv Column Details

Note: Any touch setting file using the WET1 setting will only detect one touch at a time. All touches will be cancelled when any additional touches (regardless if caused by human fingers, water drops, etc.) are detected.

	A	B	C	D	E	F
1	Product name	Touch setting package data file	ID	Author	Remarks	Touches
2	GTWV043C3A00PA	ID0002.bin		2 Noritake	Factory Default, DRY	10
3	GTWV070C3A00PA	ID0003.bin		3 Noritake	Factory Default, DRY	10
4	GTWV070VHA00P	ID0004.bin		4 Noritake	Factory Default, DRY	10
5	GTWV050VHB00P	ID0006.bin		6 Noritake	Factory Default, DRY	10
6	GTWV050C3A00PA	ID0007.bin		7 Noritake	Factory Default, DRY	10
7	GTWV070C3A00PA	ID0016.bin		16 Noritake	WET1	1 only
8	GTWV070C3A00PA	ID0017.bin		17 Noritake	WET1	1 only
9	GTWV070C3A00PA	ID0018.bin		18 Noritake	WET1	1 only
10	GTWV070C3A00PA	ID0019.bin		19 Noritake	WET1	1 only
11	GTWV050C3A00PA	ID0020.bin		20 Noritake	DRY	10
12	GTWV050C3A00PA	ID0021.bin		21 Noritake	WET1	1 only
13	GTWV050C3A00PA	ID0022.bin		22 Noritake	WET1	1 only
14	GTWV050C3A00PA	ID0023.bin		23 Noritake	WET1	1 only
15	GTWV050C3A00PA	ID0024.bin		24 Noritake	WET1	1 only
16	GTWV043C3A00PA	ID0025.bin		25 Noritake	DRY	10
17	GTWV043C3A00PA	ID0026.bin		26 Noritake	WET1	1 only
18	GTWV043C3A00PA	ID0027.bin		27 Noritake	WET1	1 only
19	GTWV043C3A00PA	ID0028.bin		28 Noritake	WET1	1 only
20	GTWV043C3A00PA	ID0029.bin		29 Noritake	WET1	1 only
21	GTWV070VHA00P	ID0031.bin		31 Noritake	WET1	1 only

Figure 2: Touch_Setting_Package_data_List.csv Contents

- Threshold_list.csv

Subjects	Contents
ID	1 - 9999
Cover Material	e.g. NON (None), GLS (Glass), ACR (Acrylic), PLC (Polycarbonate)
Cover Thickness	0 - 99.9 (Unit: mm)
Air Gap	0 - 99.9 (Unit: mm)
Condition 1	e.g. BH (Bare hand), LG (Leather Glove), PG (Polyurethane Glove), RG (Rubber Glove)
Condition 2	DRY, WET1 (small water droplets)
Conductivity	0 - 9999 (Unit : uS/cm)
Threshold (Decimal)	0 - 255
Bat file	IDxxxx_msw.bat

Table 3: Threshold_list.csv Column Details

	A	B	C	D	E	F	G	H	I
1	ID	Cover Material	Cover Thickness	Air Gap	Condition1	Condition2	Conductivity	Threshold (Decimal)	Bat file
2		2 ACR	1	0 BH	DRY		0	90	-
3		2 ACR	1	0.3 BH	DRY		0	58	-
4		2 ACR	1	0.5 BH	DRY		0	45	-
5		2 ACR	1	1 BH	DRY		0	29	-
6		2 ACR	2	0 BH	DRY		0	41	-
7		2 ACR	2	0.3 BH	DRY		0	31	-
8		2 ACR	2	0.5 BH	DRY		0	28	-
9		3 ACR	3	0 BH	DRY		0	62	-
10		3 ACR	3	0.3 BH	DRY		0	50	-
11		3 ACR	3	0.5 BH	DRY		0	43	-
12		3 GLS	1.3	0 BH	DRY		0	152	-
13		3 GLS	1.3	0 LG	DRY		0	111	-
14		3 GLS	1.3	0.3 BH	DRY		0	98	-

Figure 3: Threshold_list.csv Contents

5.2. How to Select Proper Touch Setting File and Threshold Value

Step 1: Find ID number applicable for the LCD touch screen module being used from "Touch_Setting_Package_data_List.csv".

1. Open "Touch_Setting_Package_data_List.csv", click on cell A1, navigate to the "Data" tab, and click on the "Filter" button.
2. Filter the "Product name" column so it only displays the product number matching the LCD touch screen module being used.
3. Note the ID numbers listed in this new filtered view.

Step 2: Filter "Threshold_list.csv" by ID number, then pick out the proper ID number and threshold value in this list.

1. Open "Threshold_list.csv", click on cell A1, navigate to the "Data" tab, and click on the "Filter" button.
2. Filter the "ID" column so it only displays the ID number matching the numbers noted from step 1.
3. Filter the "Cover Material" column with the cover overlay material being used in the module enclosure.

4. Filter the "Cover Thickness" column with the cover overlay thickness being used in the module enclosure. This thickness is measured as the distance between the cover overlay's front and back face.
5. Filter the "Air Gap" column with the distance between the cover overlay back face and display touch screen front face.
6. Filter the "Condition1" column with the type of touch stimulus. [BH (Bare hand), LG (Leather Glove), PG (Polyurethane Glove), RG (Rubber Glove)]
7. Filter the "Condition2" column with the expected touch screen state. (DRY, WET1) The DRY state is intended for a completely DRY environment. WET1 is intended for a wet environment where small water droplets will come in contact with the touch screen or overlay.
8. Filter the "Conductivity" column with the conductivity value of the water expected to interact with the touch screen. If the system is operating in a dry environment, then choose a conductivity value of 0. Otherwise, refer to the following table for approximate conductivity values.

Conductivity Chart	
Liquid	Conductivity (uS/cm)
Distilled Water	0.5 - 3
Tap Water	50 - 800
Industrial Wastewater	10000
Seawater	55000

Table 4: Conductivity Chart

9. At this point, only one row should be listed. Note the threshold value listed in this row. Make sure each value in this row relates to the system's environment. If they do not, please contact Noritake support to request a custom touch setting data. (cs@noritake-itrn.jp)

5.2.1. Selection Example

Example Conditions:

- Product name GTWV050C3A00PA
- Cover Material Acrylic (ACR)
- Cover Thickness 3mm
- Air Gap 1mm
- Condition1 Bare Hand (BH)
- Condition2 WET1
- Conductivity 800 (uS/cm)

1. Open "Touch_Setting_Package_data_List.csv", click on cell A1, navigate to the "Data" tab, and click on the "Filter" button.
2. Filter the "Product name" column so it only displays the product number matching the LCD touch screen module being used. In this example, choose the "GTWV050C3A00PA" model.

	A	B	C	D	E	F
1	Product name	Touch setting package data file	ID	Author	Remarks	Touche
6	GTWV050C3A00PA	ID0007.bin		7 Noritake	Factory Default, DRY	10
11	GTWV050C3A00PA	ID0020.bin		20 Noritake	DRY	10
12	GTWV050C3A00PA	ID0021.bin		21 Noritake	WET1	1 only
13	GTWV050C3A00PA	ID0022.bin		22 Noritake	WET1	1 only
14	GTWV050C3A00PA	ID0023.bin		23 Noritake	WET1	1 only
15	GTWV050C3A00PA	ID0024.bin		24 Noritake	WET1	1 only

Figure 4: Product Number Filter

- Once the filter is applied, note the resulting ID numbers. In this example, the ID numbers are 7 and 20 – 24 as seen in Figure 4.
- Open “Threshold_list.csv”, click on cell A1, navigate to the “Data” tab, and click on the “Filter” button.
- Filter the “ID” column so it only displays the ID numbers 7 and 20 – 24 as seen in Figure 5.

	A	B	C	D	E	F	G	H
1	ID	Cover Material	Cover Thickness	Air Gap	Condition	Condition	Conductivity	Threshold (Decimal)
47	7	ACR	1	0	BH	DRY	0	74
48	7	ACR	1	0.3	BH	DRY	0	55
49	7	ACR	1	0.5	BH	DRY	0	42
50	7	ACR	1	1	BH	DRY	0	21
51	7	ACR	2	0	BH	DRY	0	45
52	7	ACR	2	0.3	BH	DRY	0	32
53	7	ACR	2	0.5	BH	DRY	0	28
54	7	ACR	2	1	BH	DRY	0	15
59	20	ACR	3	0	BH	DRY	0	68
60	20	ACR	3	0.3	BH	DRY	0	44
61	20	ACR	3	0.5	BH	DRY	0	39
62	20	ACR	3	1	BH	DRY	0	27
63	20	GLS	1.3	0	BH	DRY	0	180
64	20	GLS	1.3	0	LG	DRY	0	127
65	20	GLS	1.3	0.3	BH	DRY	0	114
66	20	GLS	1.3	0.3	LG	DRY	0	76
67	20	GLS	1.3	0.5	BH	DRY	0	96
68	20	GLS	1.3	1	BH	DRY	0	52
69	20	GLS	1.8	0	BH	DRY	0	176
70	20	GLS	1.8	0	LG	DRY	0	118
71	20	GLS	1.8	0.3	BH	DRY	0	104
72	20	GLS	1.8	0.3	LG	DRY	0	68
73	20	GLS	1.8	0.5	BH	DRY	0	88
74	20	GLS	1.8	1	BH	DRY	0	48
75	21	ACR	3	0.3	BH	WET1	800	57
76	22	ACR	3	1	BH	WET1	800	36
77	23	GLS	1.3	0.3	BH	WET1	800	124
78	24	GLS	1.3	1	BH	WET1	800	57

Figure 5: Touch Setting Package Filter

- Filter the “Cover Material” column to only show ACR as seen in Figure 6.

	A	B	C	D	E	F	G	H
1	ID	Cover Material	Cover Thickness	Air Gap	Condition	Condition	Conductivity	Threshold (Decimal)
47	7	ACR	1	0	BH	DRY	0	74
48	7	ACR	1	0.3	BH	DRY	0	55
49	7	ACR	1	0.5	BH	DRY	0	42
50	7	ACR	1	1	BH	DRY	0	21
51	7	ACR	2	0	BH	DRY	0	45
52	7	ACR	2	0.3	BH	DRY	0	32
53	7	ACR	2	0.5	BH	DRY	0	28
54	7	ACR	2	1	BH	DRY	0	15
59	20	ACR	3	0	BH	DRY	0	68
60	20	ACR	3	0.3	BH	DRY	0	44
61	20	ACR	3	0.5	BH	DRY	0	39
62	20	ACR	3	1	BH	DRY	0	27
75	21	ACR	3	0.3	BH	WET1	800	57
76	22	ACR	3	1	BH	WET1	800	36

Figure 6: Cover Material Filter

7. Filter the “Cover Thickness” column to only show 3mm thickness.
8. Filter the “Air Gap” column to only show 1mm thickness as seen in Figure 7.

	A	B	C	D	E	F	G	H
1	ID	Cover Material	Cover Thickness	Air Gap	Condition	Condition	Conductivity	Threshold (Decimal)
62	20	ACR	3	1 BH	DRY		0	27
76	22	ACR	3	1 BH	WET1		800	36

Figure 7: Air Gap Filter

9. Filter the “Condition2” column to only show WET1 as seen in Figure 8.

	A	B	C	D	E	F	G	H
1	ID	Cover Material	Cover Thickness	Air Gap	Condition	Condition	Conductivity	Threshold (Decimal)
76	22	ACR		1 BH	WET1		800	36

Figure 8: Condition2 Filter

10. At this point, only one row should be listed. The recommended threshold is specified in this row as 36. Make sure each value in this row relates to the system’s environment. If they do not, please contact Noritake support to request a custom touch setting data. (cs@noritake-itron.jp)
11. Test the selected touch setting file “ID0022” and threshold of 36 on the LCD touch screen module within the example conditions.

5.3. Touch Setting File and Threshold Selection Overview

Figure 9 and Figure 10 visualize the touch setting file and threshold selection process. The red boxes show the selected values based on the example conditions from section 5.2.1.

	A	B	C	D	E	F
1	Product name	Touch setting package data file	ID	Author	Remarks	Touches
2	GTWV043C3A00PA	ID0002.bin		2 Noritake	Factory Default, DRY	10
3	GTWV070C3A00PA	ID0003.bin		3 Noritake	Factory Default, DRY	10
4	GTWV070VHA00P	ID0004.bin		4 Noritake	Factory Default, DRY	10
5	GTWV050VHB00P	ID0006.bin		6 Noritake	Factory Default, DRY	10
6	GTWV050C3A00PA	ID0007.bin		7 Noritake	Factory Default, DRY	10
7	GTWV070C3A00PA	ID0016.bin		16 Noritake	WET1	1 only
8	GTWV070C3A00PA	ID0017.bin		17 Noritake	WET1	1 only
9	GTWV070C3A00PA	ID0018.bin		18 Noritake	WET1	1 only
10	GTWV070C3A00PA	ID0019.bin		19 Noritake	WET1	1 only
11	GTWV050C3A00PA	ID0020.bin		20 Noritake	DRY	10
12	GTWV050C3A00PA	ID0021.bin		21 Noritake	WET1	1 only
13	GTWV050C3A00PA	ID0022.bin		22 Noritake	WET1	1 only
14	GTWV050C3A00PA	ID0023.bin		23 Noritake	WET1	1 only
15	GTWV050C3A00PA	ID0024.bin		24 Noritake	WET1	1 only
16	GTWV043C3A00PA	ID0025.bin		25 Noritake	DRY	10
17	GTWV043C3A00PA	ID0026.bin		26 Noritake	WET1	1 only
18	GTWV043C3A00PA	ID0027.bin		27 Noritake	WET1	1 only
19	GTWV043C3A00PA	ID0028.bin		28 Noritake	WET1	1 only
20	GTWV043C3A00PA	ID0029.bin		29 Noritake	WET1	1 only
21	GTWV070VHA00P	ID0031.bin		31 Noritake	WET1	1 only

Figure 9: Touch Setting Package ID Number Selection Visualization

Result: Applicable IDs are 7 and 20-24 for GTWV050C3A00PA

	A	B	C	D	E	F	G	H
1	ID	Cover Material	Cover Thickness	Air Gap	Condition1	Condition2	Conductivity	Threshold (Decimal)
46	6	ACR	2	1 BH	DRY		0	15
47	7	ACR	1	0 BH	DRY		0	74
48	7	ACR	1	0.3 BH	DRY		0	55
49	7	ACR	1	0.5 BH	DRY		0	42
50	7	ACR	1	1 BH	DRY		0	21
51	7	ACR	2	0 BH	DRY		0	45
52	7	ACR	2	0.3 BH	DRY		0	32
53	7	ACR	2	0.5 BH	DRY		0	28
54	7	ACR	2	1 BH	DRY		0	15
55	16	ACR	3	0.3 BH	WET1		800	52
56	17	ACR	3	1 BH	WET1		800	32
57	18	GLS	1.3	0.3 BH	WET1		800	114
58	19	GLS	1.3	1 BH	WET1		800	53
59	20	ACR	3	0 BH	DRY		0	68
60	20	ACR	3	0.3 BH	DRY		0	44
61	20	ACR	3	0.5 BH	DRY		0	39
62	20	ACR	3	1 BH	DRY		0	27
63	20	GLS	1.3	0 BH	DRY		0	180
64	20	GLS	1.3	0 LG	DRY		0	127
65	20	GLS	1.3	0.3 BH	DRY		0	114
66	20	GLS	1.3	0.3 LG	DRY		0	76
67	20	GLS	1.3	0.5 BH	DRY		0	96
68	20	GLS	1.3	1 BH	DRY		0	52
69	20	GLS	1.8	0 BH	DRY		0	176
70	20	GLS	1.8	0 LG	DRY		0	118
71	20	GLS	1.8	0.3 BH	DRY		0	104
72	20	GLS	1.8	0.3 LG	DRY		0	68
73	20	GLS	1.8	0.5 BH	DRY		0	88
74	20	GLS	1.8	1 BH	DRY		0	48
75	21	ACR	3	0.3 BH	WET1		800	57
76	22	ACR	3	1 BH	WET1		800	36
77	23	GLS	1.3	0.3 BH	WET1		800	124
78	24	GLS	1.3	1 BH	WET1		800	57
79	25	ACR	3	0 BH	DRY		0	73

Figure 10: Threshold Value Selection Visualization

Result: Touch setting file = ID0022.bin, threshold value = 36

5.4. Touch Setting Package Search Sheet

In the touch setting package search sheet, you can search for suitable touch setting package data files for various recommended usage conditions. Using the most suitable touch setting package, under the recommended usage conditions, enables touch operation with optimal touch sensitivity.

Reference file: Touch_Setting_Package_Search_Sheet_e.xlsx

Steps:

1. Select the usage conditions from the file.
2. The package ID and the recommended threshold value are displayed in the Search results.

Example Conditions:

- Product name GTWV070C3A00PA
- Touch condition DRY
- Cover Material Glass
- Cover Thickness 1.8mm
- Air Gap 0.5mm

Search Results: Touch setting file = ID0082.bin, threshold value = 69

Product name	Touch condition	Cover material	Cover thickness	Air gap	package ID	Recommended threshold value
GTWV070C3A00PA	DRY	Glass	1.8	0.5	ID0082.bin	69

6. Touch Setting Data Registration / Threshold Value Set-up for GT-CP series Command Controlled

For GT-VP (1P) type modules, please refer to [Touch Setting Data Registration / Threshold Value Set-up for GT-VP series Digital Video Input](#).

6.1. GTOMP | How to Save and Enable Touch Setting Data

- 1) Run GTOMP after the tool is downloaded.

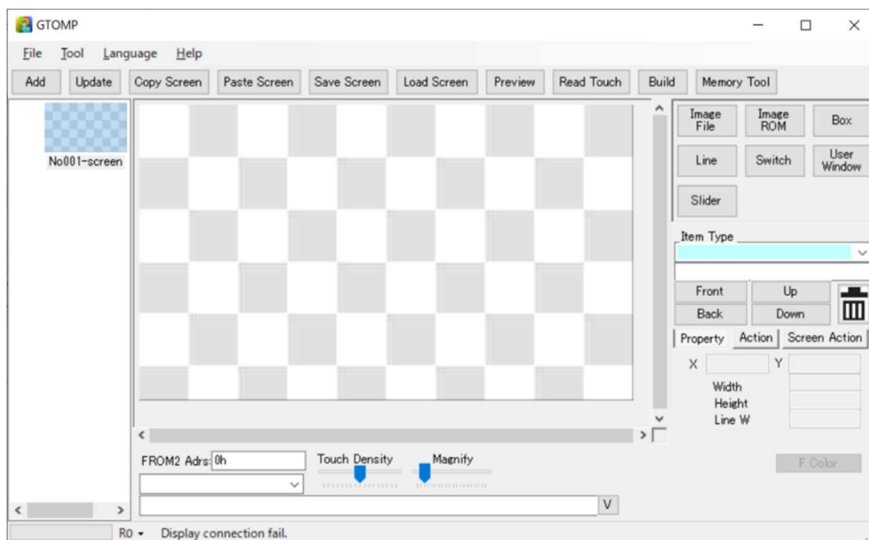


Figure 11: GTOMP

- 2) Set up communication.
 1. Select the connected display's product name from the drop-down menu located at the bottom of GTOMP.
 2. Select the appropriate port from the second drop-down menu.

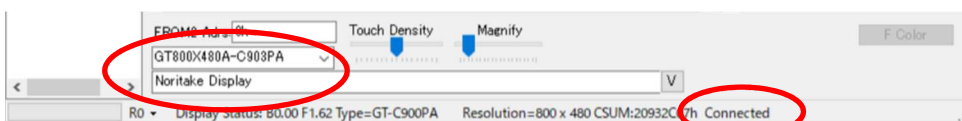


Figure 12: Bottom of GTOMP

WinUSB and Virtual COM are compatible.

WinUSB is recommended as it is already installed in Windows 8.1 and later.

For WinUSB: "Noritake Display"

For Virtual COM: The installed Virtual COM number

If the connection is successful, then "Connected" will be displayed on the status bar. (see Figure 12)

Note: The WinUSB for Windows 7 or Virtual COM driver needs to be installed in advance. For driver installation information, please refer to the GT-CP series application note: <https://www.noritake-itron.jp/eng/cs/appnote/>

- 3) Click on the “Memory Tool” button in the top right corner of GTOMP.
The memory tool will open.

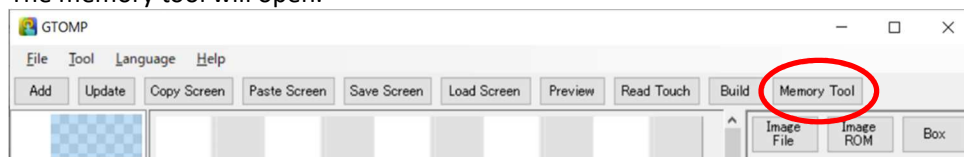


Figure 13: Memory Tool Button

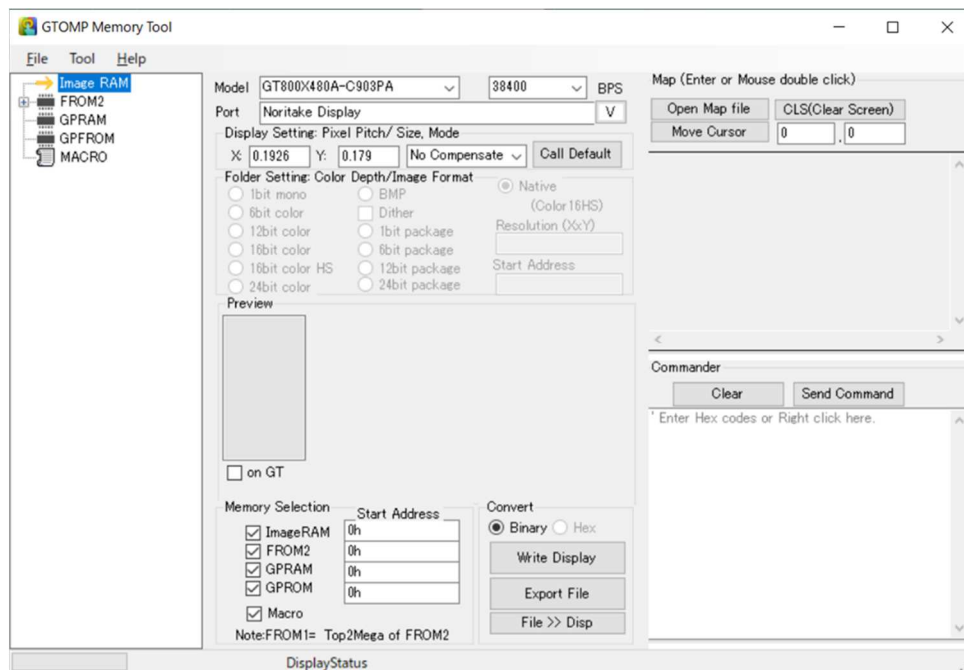


Figure 14: Memory Tool

- 4) Navigate to “Tool” > “Touch Setting Package Data” > “Store”. Now select a slot number to save the touch setting file to. (“No.1”, “No.2”, “No.3”, or “No.4”)

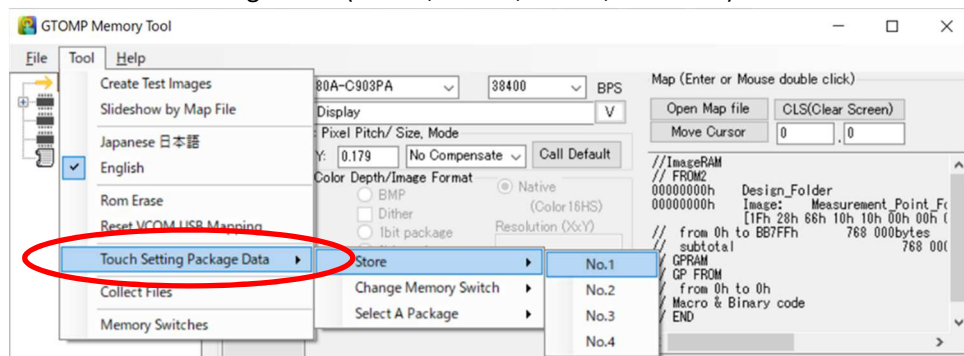


Figure 15: Store Touch Setting Package Data

- 5) Once a number is selected, an “Open File” dialog box will appear. Select the desired touch setting file to be stored and click “Open”.
- 6) The touch setting file is now saved to the connected GT-CP module.

- 7) To enable a touch setting file saved in a LCD touch screen module, navigate to “Tool” > “Touch Setting Package Data” > “Select a Package”. Select the package slot number matching the touch setting file that was saved. (Package 1 – Package 4) The touch setting file is now active on the connected GT-CP module.

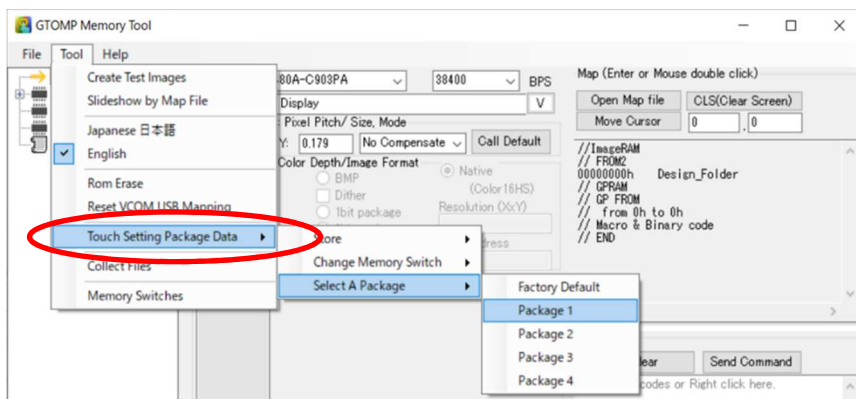


Figure 16: Select Touch Package

To activate a touch setting file saved in a LCD touch screen module automatically after power ON or reset, an internal memory SW needs to be configured. This memory switch configuration procedure is explained in step 8.

- 8) Navigate to “Tool” > “Touch Setting Package Data” > “Change Memory Switch” > “Set Package1”. Now the selected touch setting file will be active after the GT-CP module is reset.

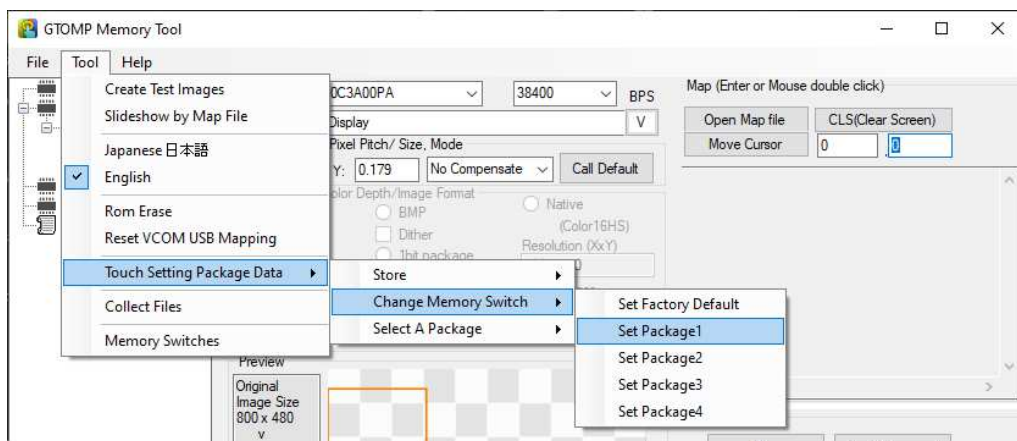


Figure 17: Change Memory Switch

6.2. GTOMP | How to Save and Enable Threshold Value

- 1) Navigate to “Tool” > “Change Touch Threshold (Memory Switch)” on the GTOMP’s main menu.

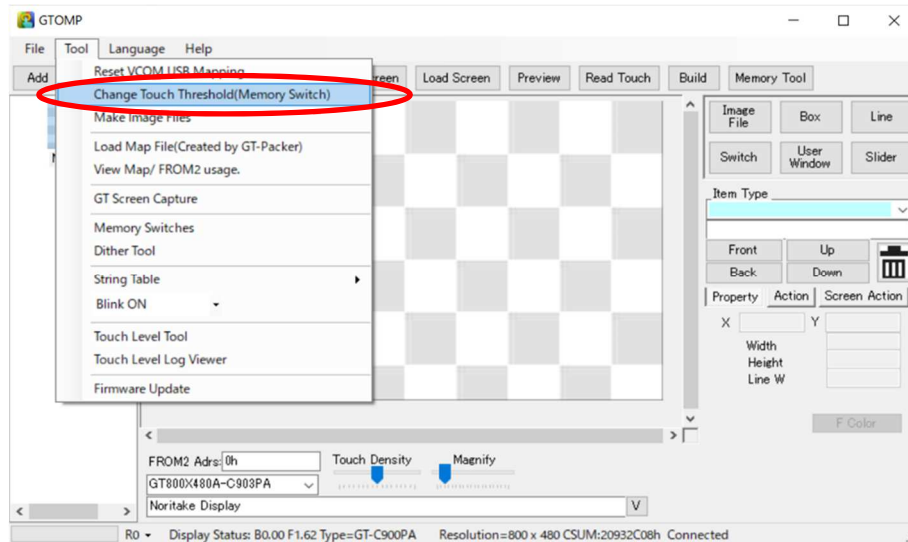


Figure 18: Change Touch Threshold

- 2) The “TPSensitivity” window will appear. The threshold value can be changed by moving the slide bar next to the “Threshold 00 to ffh” label. The threshold value on the connected GT-CP module is changed to the new threshold value by clicking the “OK” button. This will also update the respective memory switch so the touch threshold value is saved upon GT-CP module reset.

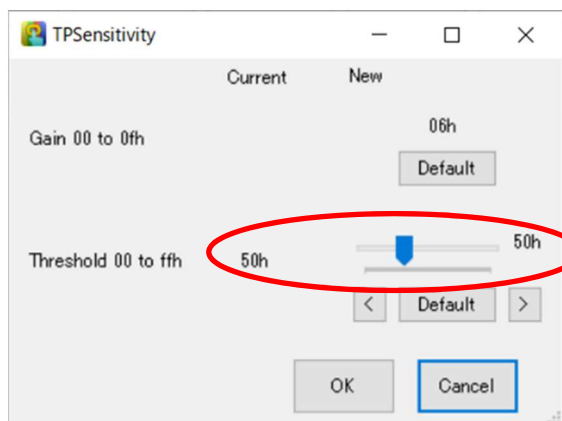


Figure 19: Threshold Adjustment

00h(High Sensitivity) <<<<< Threshold Value >>>>> FFh(Noise Immunity)

6.3. Memory SW setting (Required when using touch setting package data with a batch file)

After registering touch setting data and saving the threshold value, please run the batch file (IDxxxx_msw.bat) in the "msw_setting" folder to complete Memory SW setting.

e.g.

When using ID0063 package data, please run 'ID0063-ID0092_msw.bat'.

Note1: For the batch file to be used, refer to the "Bat file" item in the threshold value list Threshold_List.csv. (If it appears in the list as "-", it is not necessary to execute a batch file.)

Note2: An error might occur when the batch file is run if the pass name is too long.
If necessary, put "msw_setting" folder in drive C (for example) and then run the batch file.

Please check the touch screen's adjusted sensitivity. If it is not satisfactory, the touch sensitivity can be adjusted by changing the threshold value again.

7. Touch Setting Data Registration / Threshold Value Set-up for GT-VP series Digital Video Input

7.1. GT-1Pass | How to Save and Activate a Touch Setting File

1) GT-1Pass Start-up

1. Connect a GT-VP(1P) module to a PC and apply power to the GT-VP(1P) module. Run the GT-1Pass tool.
2. From the main menu, select "Noritake Display" from the "Port" drop-down menu.
3. The connected display's product information is automatically read out and displayed in the "Product Info" section.

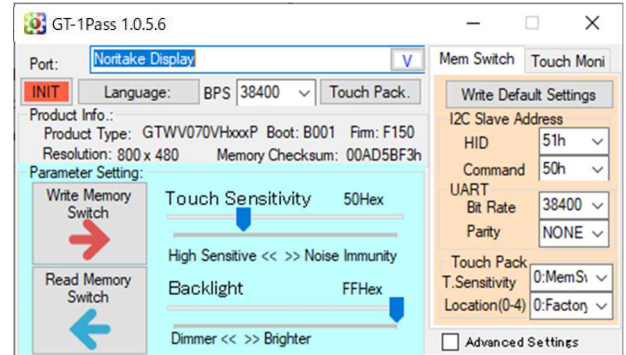


Figure 20: GT-1Pass

2) Save touch setting file

1. Click on the "Touch Pack" button and the "Touch Setting Package" window will appear.
2. Select "1" as the package destination and click "Store".

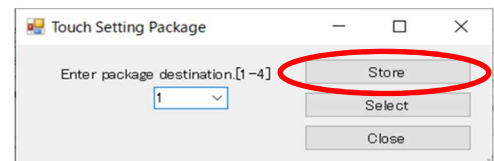


Figure 21: Store Package

3. A file selection dialog will appear. Select the desired touch setting file to be saved to the connected GT-VP(1P) module. A "Registration Completed" message will appear.
4. The touch setting data saved in the above steps will remain active until the GT-VP(1P) module is shut down. To make the touch setting file stay active after power ON or reset, an internal memory switch needs to be set up. This procedure is illustrated below (step 3).

3) How to enable a touch setting file automatically after GT-VP(1P) module startup

1. Select "1: Pack1" from the "Location (0-4)" drop-down menu in the bottom right section of GT-1Pass.
2. Click on the "Write Memory Switch" button.
3. All memory switch values have been updated. The touch setting file in destination #1 will now load upon GT-VP(1P) module reset.

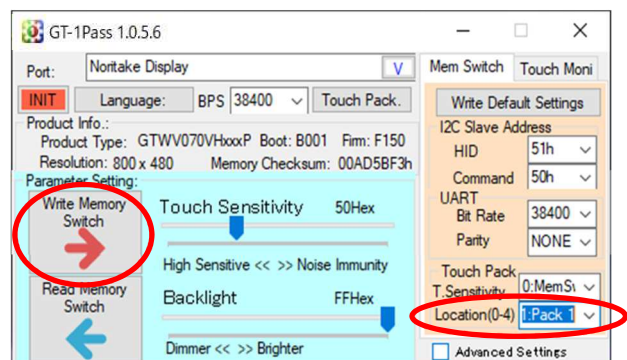


Figure 22: Change Package Location Memory Switch

7.2. GT-1Pass | How to Adjust and Save the Touch Threshold Value

1. From the section 5 “Touch Setting File and Threshold Value Selection”, find threshold value listed for the condition closest to the GT-VP(1P) module’s environment and assembly.
2. Move the touch sensitivity slide bar to the desired threshold value. This will change the module’s threshold value. An "OK" button will appear and start counting down from 10. If the threshold setting is correct, click on the "OK" button before the count reaches zero.

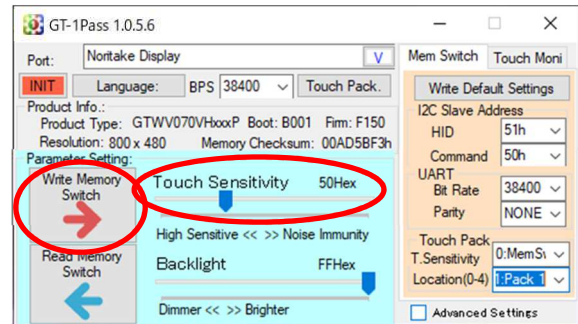


Figure 23: Set Threshold Memory Switch

3. Click the “Memory Switch Write” button to save the threshold value.
4. Now, the threshold value is saved and will remain active until further memory switch changes are made.



Figure 24: OK Button

Note: If the “OK” button wasn't clicked, the touch sensitivity slide bar will return to the previous position.

7.3. Memory SW setting (Required when using touch setting package data with a batch file)

After registering touch setting data and saving the threshold value, please run the batch file (IDxxxx_msw.bat) in the “msw_setting” folder to complete Memory SW setting.

e.g.

When using ID0050 package data, please run ‘ID0050_msw.bat’.

Note1: For the batch file to be used, refer to the "Bat file" item in the threshold value list Threshold_List.csv. (If it appears in the list as "-", it is not necessary to execute a batch file.)

Note2: An error might occur when the batch file is run if the pass name is too long. If necessary, put “msw_setting” folder in drive C (for example) and then run the batch file.

Note3: If the threshold is readjusted after executing the batch file, it is necessary to execute the batch file again after adjusting the threshold.

7.4. GT-1Pass | Simple Touch Screen Test

Do a simple test to see if the registered threshold value is appropriate.

1. Click on the "Touch Moni" tab, and select "Single" from the drop-down menu*.
*A pop-up window will appear. Click on the "OK" button.
2. Slide your finger across the touch screen in the indicated pattern. (see Figure 26)
3. Coordinates will be displayed in the right window. If the following symptoms occur; the touch screen sensitivity needs to be adjusted.

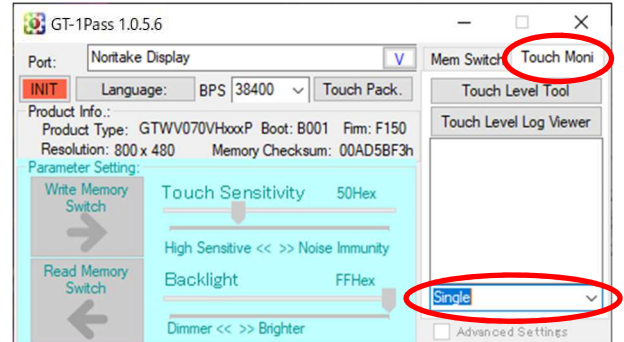
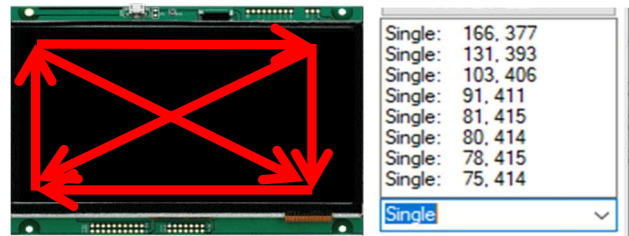


Figure 25: GT-1Pass Touch Monitor

- No response while sliding finger across the touch screen.
 - There are responses before the finger touches the touch screen.
4. If no symptoms occur, the touch screen is fine.
 5. Select "OFF" from the drop-down menu.
 6. The simple touch screen test is finished.



Slide Touch Test

Test Result

Figure 26: Single Touch Slide Test

8. How to Monitor Sensitivity and Optimize Threshold Value

After the initial threshold value is set up, observe touch sensitivity with the touch level monitoring tool and adjust the threshold value so the touch screen works properly.

Contact a Noritake sales representative before the above threshold optimization is implemented if:

- LCD touch screen module conditions cannot be found on “Touch_Setting_Package_data_List.csv” and “Threshold_list.csv”.
- LCD touch screen module is used in wet or damp conditions.

8.1. Threshold Optimization Process GT-CP series Command Controlled GTOMP

The following steps need to be implemented after a touch setting file has been saved and enabled.

1. Select the product name from the drop-down menu of the lower part of the GTOMP, and also select the port from the drop-down menu below.
2. Select “Touch Level Monitoring Tool” from “Tool” menu. A pop-up window, “Show touch target marker?” will appear. Click on the “Yes” button.

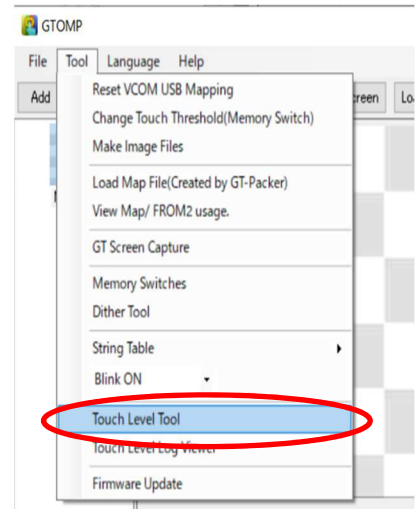


Figure 27: GTOMP Touch Level Tool Button

The module and PC display the following:

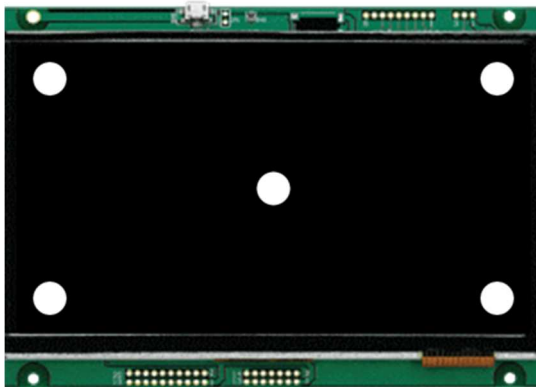


Figure 28: Touch Target Marker (7"Display)

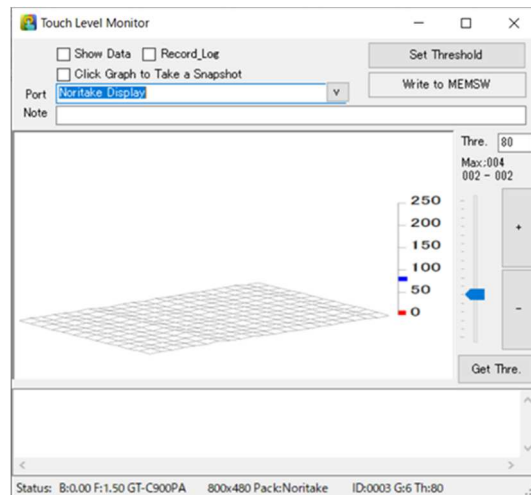


Figure 29: Touch Level Tool Window

GT-VP series Digital Video Input GT-1Pass

The following steps need to be implemented after saving and activating a touch setting file.

1. Select "Touch Level Tool" from the "Touch Moni" tab.
2. Two dialog boxes will appear. Click on the "OK" and "Yes" buttons.
3. If the operating system's display setting is set to "Extend", a "Select Screen" window will appear. Select the module in the drop-down menu and click on the "OK" button.

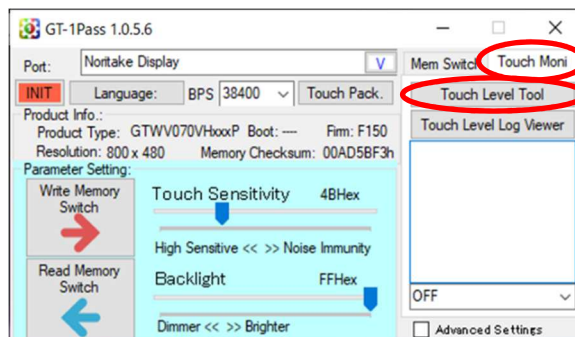


Figure 30: GT-1Pass Touch Level Tool Button

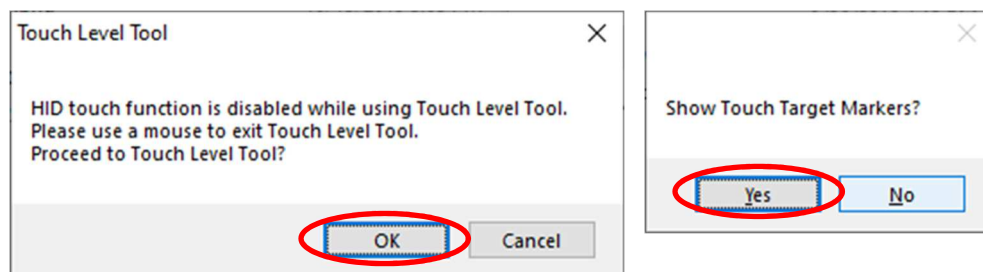


Figure 31: Touch Level Tool Pop-up Windows

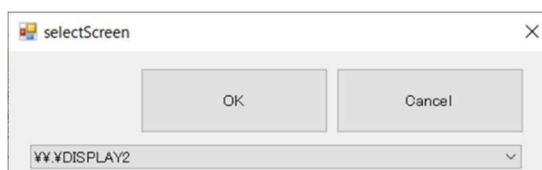


Figure 32: Select Screen Window

The module will display the following:

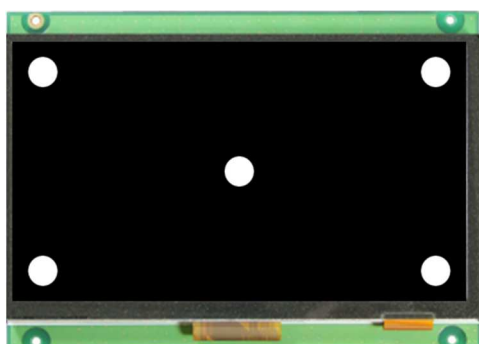


Figure 33: Touch Target Marker (for 7" GT-VP(1P))

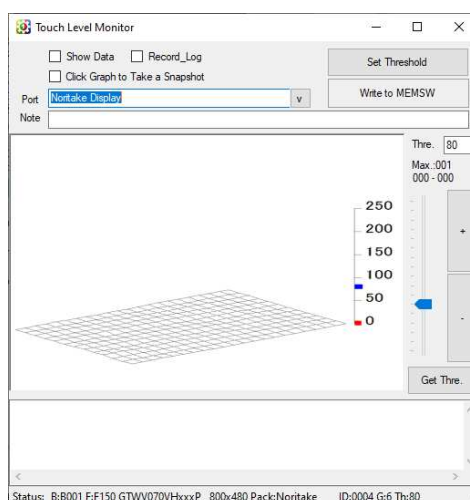


Figure 34: Touch Level Monitor Window

1) Touch Level Tuning

Touch on surface of touch screen.
A 3D surface peak (touch level) will appear relative to the touch point on the screen.
As illustrated by the window image, the threshold value is 80 and color of the peak lines from 80 or higher is red. Appropriate threshold value is between 50% and 75% of peak height from bottom.

In Figure 35, the peak value is 200. Compared to the current threshold value, the appropriate threshold value is between 100 and 150. Be sure to check whether this threshold value is appropriate at the 5 main touch screen test points. The next paragraph explains how to decide and check the threshold value.

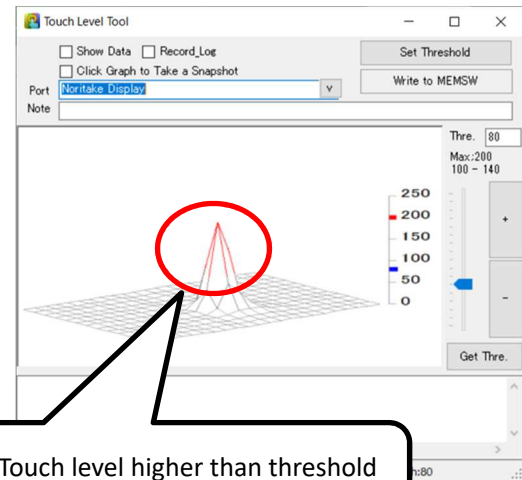


Figure 35: Touch Level Peak

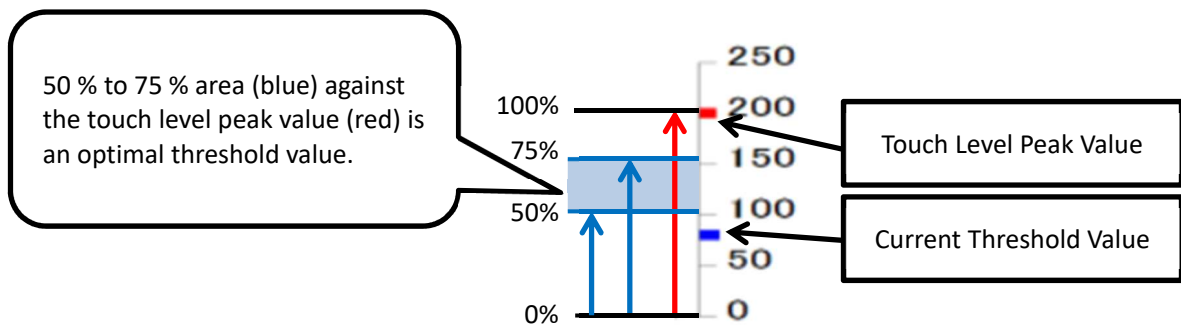


Figure 36: Touch Threshold and Peak Chart

2) Touch Level Recording

Record touch level and find appropriate threshold value as observing the recorded touch level.

Check "Record_Log" checkbox. Choose where to save the log file.

Touch recording will start right after the "Record_Log" box is checked.

Note: The "Show Data" box is automatically checked during touch recording.

Touch at least three (3) times on each white colored dot as shown in the Figure 37.

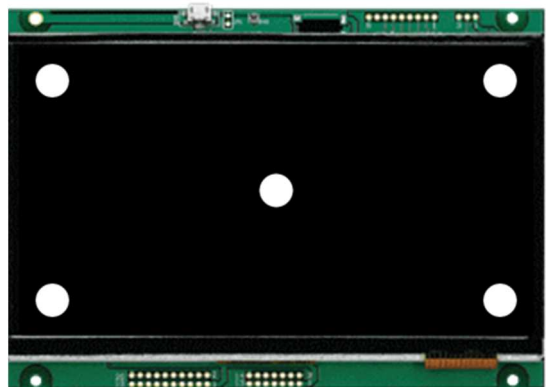


Figure 37: LCD touch screen module with Test Points

After all positions are touched, uncheck the "Record Log" box. Recording is completed.

3) Playing a Log File

Open the log file recorded in step 3. A touch log file can be played multiple times. This is very useful when testing for an optimal threshold value.

1. Open the "Touch level Log Viewer".

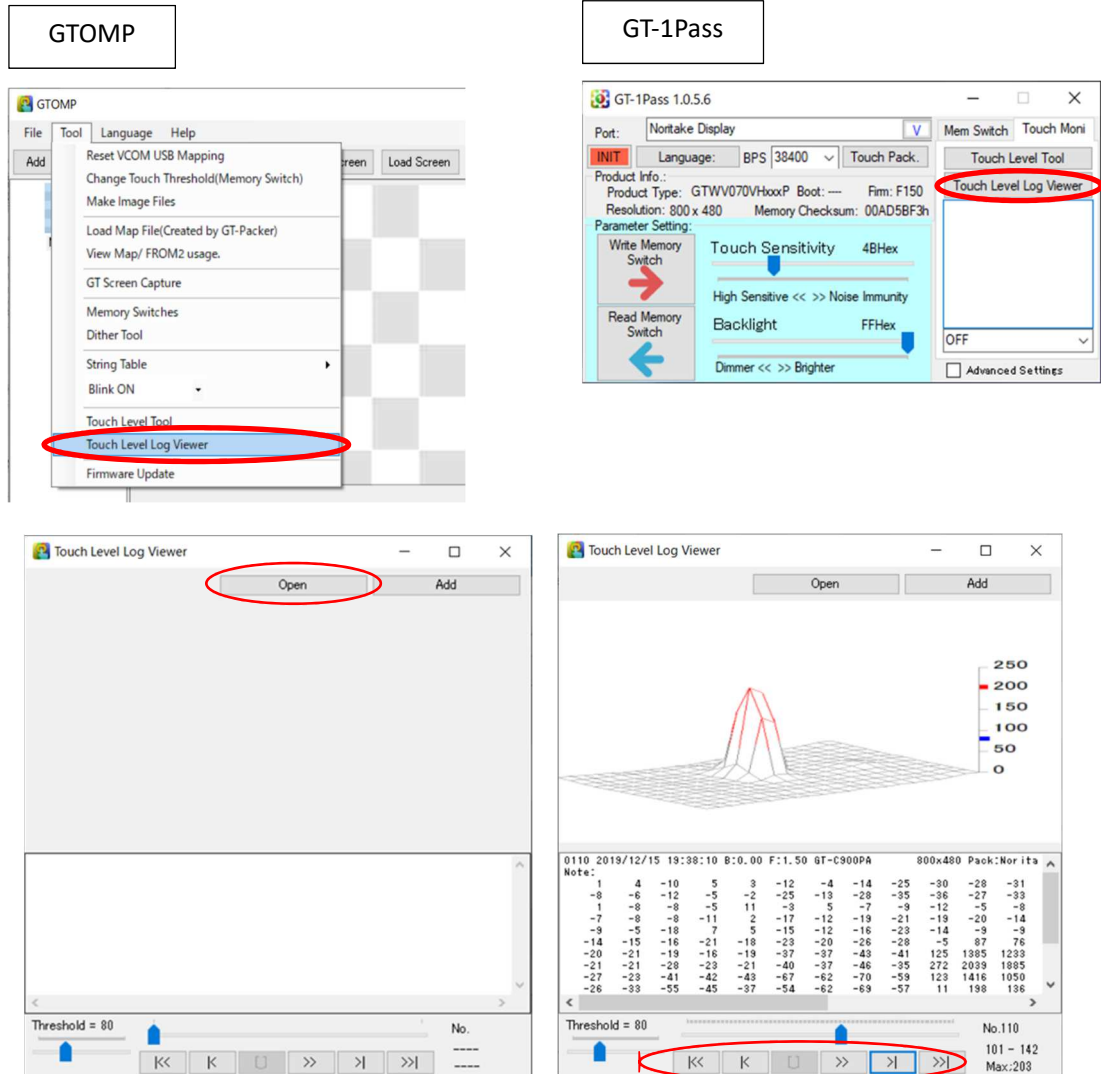


Figure 38: How to Get to Touch Level Log Viewer

2. After the "Touch Log Level Viewer" window appears, click the "Open" button to open a touch log file.

Description of each button:

- >> : Play log file
- [] : Stop log file
- >| : Forward 1 frame
- >>| : Move to last frame
- |< : Move back 1 frame
- |<< : Move to first frame

4) Finding an Appropriate Threshold Value

Look at the touch level frame by frame and write down the highest touch level peak value for each frame. Please refer to Figure 40: Threshold Value Calculation Sheet at the bottom of this page.

The relation between the touch level peak value and the threshold value is as follows:

$$\text{Lower limit threshold value (50\%)} = (\text{Touch level peak value} / 8) * 0.5$$

$$\text{Upper limit threshold value (75\%)} = (\text{Touch level peak value} / 8) * 0.75$$

Close the "Touch Level Log Viewer" window after writing down all peak value data.

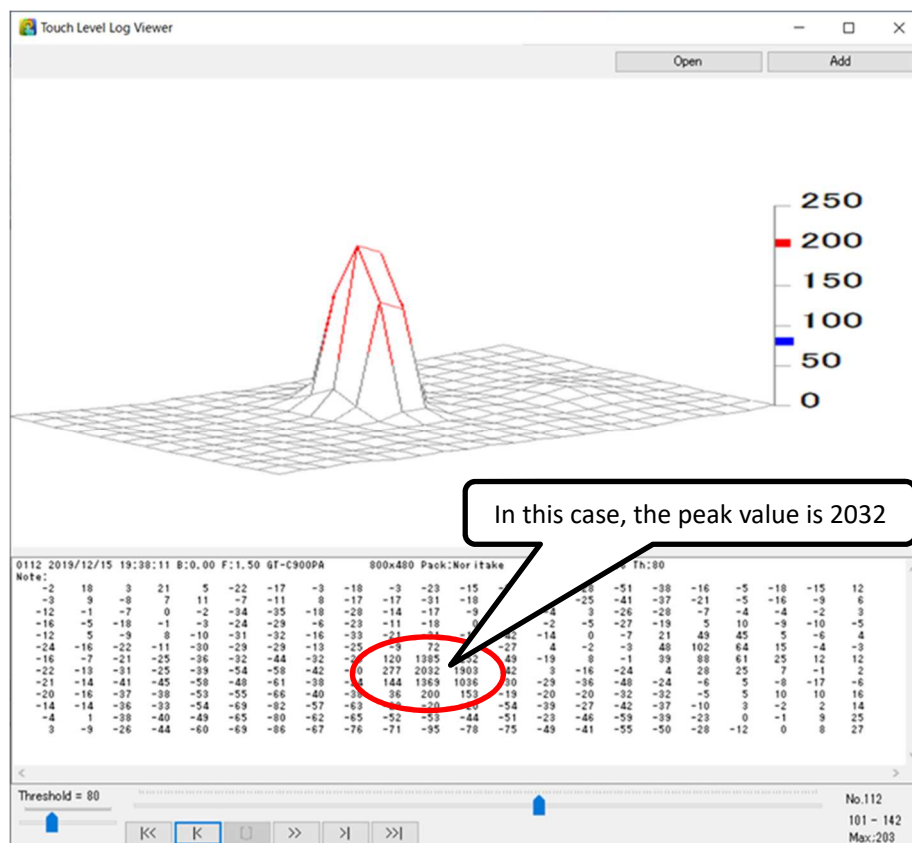


Figure 39: Touch Level Tool

A1											
	A	B	C	D	E	F	G	H	I	J	K
1											
2			Touch Level Peak Value				Threshold Value				
3			1	2	3	Average	Lower Limit	Upper Limit	Max. Lower Limit		Min. Upper Limit
4		Upper Left	0	0	0	=AVERAGE(C4:E4)	=0.5*F4/8	=0.75*F4/8	=MAX(G4:G8)		=MIN(H4:H8)
5		Lower Left	0	0	0	=AVERAGE(C5:E5)	=0.5*F5/8	=0.75*F5/8			
6		Middle	0	0	0	=AVERAGE(C6:E6)	=0.5*F6/8	=0.75*F6/8			
7		Upper Right	0	0	0	=AVERAGE(C7:E7)	=0.5*F7/8	=0.75*F7/8			
8		Lower Right	0	0	0	=AVERAGE(C8:E8)	=0.5*F8/8	=0.75*F8/8			

Figure 40: Threshold Value Calculation Sheet

5) Temporary Threshold Value Setting

1. Go back to the "Touch Level Tool".
2. Look at all threshold values found in the "Finding an Appropriate Threshold Value" section. Find the appropriate threshold value and determine the appropriate value that falls within the upper and lower limit of all threshold values.
3. After determining the appropriate threshold value, type the value in "Thre." field, then click the "Set Threshold" value. This will set the typed-in value to the connected GT-CP module.

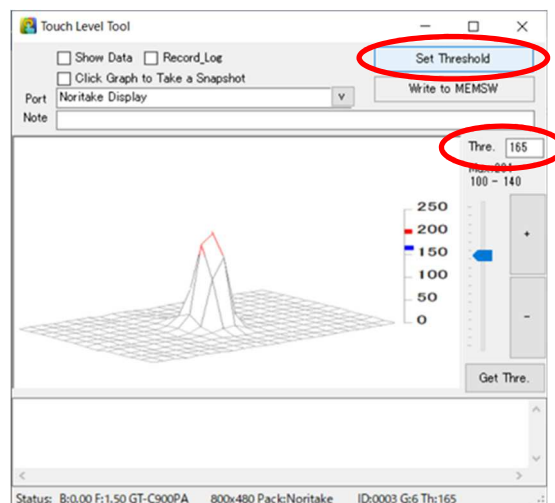


Figure 41: Touch Level Tool Set Threshold

6) Threshold Value Tuning: Option 1

Touch the 5 touch target marks and check if the threshold value set up is between 50% and 75% of the touch level (peak height) from the bottom.

[Expression]

$$\text{Threshold Value} * 8 / 0.75 < \text{Touch Level Peak Value} < \text{Threshold Value} * 8 / 0.5$$

The threshold value can be adjusted by clicking the "+" or "-" buttons. After the appropriated value is selected, click the "Set Threshold" button.

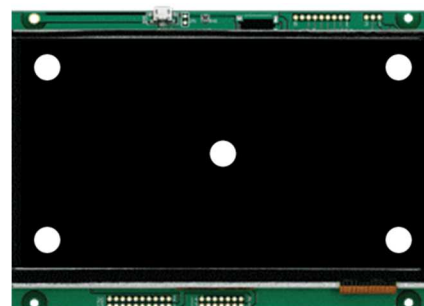


Figure 42: LCD touch screen module with Test Points

7) Threshold Value Tuning: Option 2

1. Put your finger close to the touch screen surface (without touching it) and make sure the touch level (peak height) is lower than the threshold value set up above. If the peak lines do not turn red, it is not necessary to adjust the threshold value any further.
2. If any part of the peak line is red, increase the threshold value until the line is gray. After this adjustment, check the touch level shown in 8-1-6 followed by 8-1-7. Repeat 8-1-6 and 8-1-7 until you can determine the appropriate value.

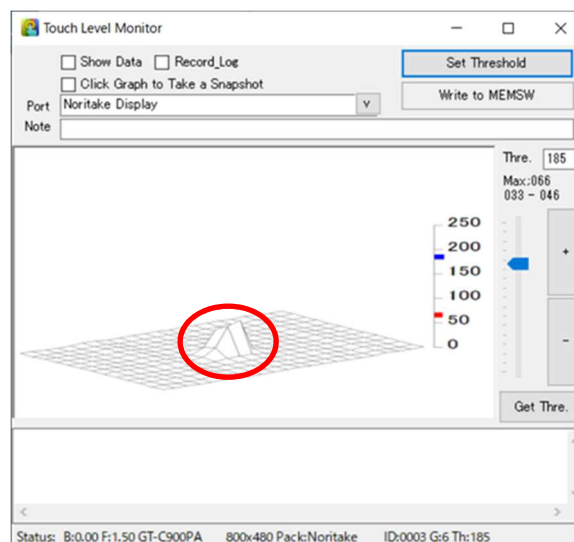


Figure 43: Low Peak Value

8) Apply the fine-tuned threshold value.

1. Click the “Write to MEMSW” button.
2. The threshold value is now saved to the connected GT-CP module.
3. The module will start up with this new threshold value automatically applied.

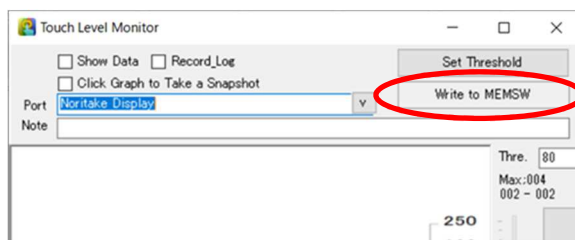


Figure 44: Touch Level Monitor Write to Memory Switch

9. Reference

9.1. How to Check Touch Setting File Status (Active / Inactive)

The following procedure teaches you how to check if touch a setting package file is active or inactive on a GT-CP module.

1. Type the command text as shown in the following example in the command window in the GTOMP Memory Tool.
2. Click the “Send Command” button. By reading the response data from the connected GT-CP module, you can find which touch setting file is selected and if it is active or inactive.

<Example>

Send Command

```
COMMAND1: 1fh 28h 65h 40h 70h
COMMAND2: 1fh 28h 65h 40h 71h
```

Module Response

```
HEX1: 28 65 40 49 54 52 4F 4E 20 47 54 57 56 30 37 30 43 20
TEXT1: (e@ITRON.GTWV070C.
HEX2: 28 65 40 30 30 30 30
TEXT2: (e@0000
```

9.2. Contact Information

Noritake Itron Corp. Sales Department
Email: sales@noritake-itron.jp