System Bit and Register Reference

Local memory

Local memory resides in DRAM and every value is initialized to zero at system start up.
The HMI is equipped with following local memory ranges:

LB 0000 ~ 9999 (Bit devices) Segmented in groups of 16 bits as follows:

LB 15~0
LB 31~16
LB 47~32
. . . .
LB 9983~9968
LB 9999~9984

LW 0000 ~ 9999 (Word devices)

LW0
LW1
LW2
. . . .
LW9998
LW9999

Each LBnnnn is a 1-bit device and each LWnnnn is a 16-bit device. These devices use separate memory areas and do not overlap (i.e. LB0000 is not the first bit of LW0000. Changing LB0000 does not affect LW0000).

Note: The Local Bit and Word addresses above 8999 are reserved for system use.

Remote memory

When using Master - Slave hardware configurations, the Slave HMIs can access the Master's Local memory.

Master local memory ranges:
Ms_LB 0000 ~ 9999 (Bit devices) and **Ms_LW** 0000 ~ 9999 (Word devices).

Reserved Local Words/Bits

Some Local Words, Local Bits and Recipe Words are reserved for special purposes. Users should not use these areas except for their specified purposes.

Local Bits: 9000~9999 are reserved
Local Words: 9000~9999 are reserved

Reserved Local Bits

LB Address	Description	NOTE	Version
9000~9009	Initialized as **ON**	Use these bits for objects that need an initial setting of ON. (read/write)	ver 1.2
9010	**Recipe** download indicator, it is: Set ON when downloading Set OFF when download done	Use this bit to indicate when a recipe download is in progress (read/write).	ver 1.2
9011	**Recipe** upload indicator, it is: Set ON when uploading Set OFF when upload done	Use this bit to indicate when a recipe upload is in progress. (read/write)	ver 1.2
9012	**Recipe** download/upload indicator, it is: Set ON when transferring data Set OFF when transfer done	Use this bit to indicate when any recipe transfer is in progress. (read/write)	ver 1.2
9013	Task bar **Touch Indicator** pressed bit, it is: Set ON when **Touch Indicator** is pressed	This bit does not return the state of the "touch indicator". (read/write)	Ver 1.4

LB Address	Description	NOTE	Version
9014	Task bar **CPU Indicator** pressed bit, it is: Set ON when **CPU Indicator** is pressed	This bit does not return the state of the ”CPU indicator”. (read/write)	Ver 1.4
9015	Task bar **Alarm Indicator** pressed bit, it is: Set ON when **Alarm Indicator** is pressed	This bit does not return the state of the ”alarm indicator”. (read/write)	Ver 1.4
9016	**Print Error** indicator: Changes to 1 when printing fails	Use to trigger an alarm or event to let the user know there is a problem with printing. (read only)	Ver 1.4
9017	**Printer** enable bit. The user: Sets ON to disable print functions. Sets OFF to enable print functions.	Setting in System Parameters must have a printer selected for this Bit to have an effect. (read/write)	Ver 1.4
9020	**Pen** enable bit. The user: Sets ON to enable pen functions.	Positive edge trigger. Message board use (read/write)	Ver 1.4
9021	**Brush** (Eraser) enable bit. The user: Sets ON to enable brush functions.	Positive edge trigger. Message board use (read/write)	Ver 1.4
9022	**Clipping** enable bit. The user: Sets ON to enable clip functions.	Positive edge trigger. Message board use (read/write)	Ver 1.4
9030	**Pen** width to 1 pixel enable bit. The user: Sets ON to set pen width to 1 pixel.	Positive edge trigger. Message board use (read/write)	Ver 1.4
9031	**Pen** width to 2 pixels enable bit. The user: Sets ON to set pen width to 2 pixels.	Positive edge trigger. Message board use (read/write)	Ver 1.4
9032	**Pen** width to 3 pixels enable bit. The user: Sets ON to set pen width to 3 pixels.	Positive edge trigger. Message board use (read/write)	Ver 1.4
9040	**Fast Selection** window enable bit. The user: Sets ON to hide Fast Selection window. Sets OFF to show (pop-up) Fast Selection window.	This bit overrides the System Parameter Task Bar setting. (read/write)	Ver 1.4
9041	**Task Bar** enable bit. The user: Sets ON to hide the Task Bar. Sets OFF to show (pop-up) the Task Bar.	Task Bar control (read/write)	Ver 1.4
9042	**Task Buttons** enable bit. The user: Sets ON to hide the two Task Buttons. Sets OFF to show (pop-up) the two Task Buttons.	Task Bar control (read/write)	Ver 1.4
9043	Hide/Show Task Items (**Fast Selection** screen, **Task Bar** and **Task Buttons**) The user: Sets ON to hide the Task Items. Sets OFF to show (pop-up) the Task Items.	When enabled, all items appear in their activated state. Task Bar and Fast Selection window are opened. (read/write)	Ver 1.4
9044	Enable changes made to System Parameters in Retentive memory area. The user: Sets ON to make the Security **Passwords**, **Backlight** and **Buzzer** System Parameters active. OFF has no effect.	Forcing this bit ON restores Security Passwords, Backlight and Buzzer system parameters from Reserved Retentive word area. After restoration, the system sets this bit OFF. (read/write)	Ver 2.1
9045	**Reset** HMI. The user: Sets ON to reset the HMI.	Forcing this bit ON resets the HMI. (write)	Ver 2.1
9046	**Security** level change event indicator.	Changes to 1 when going from a lower security level to a higher security level. (read only)	Ver 2.1

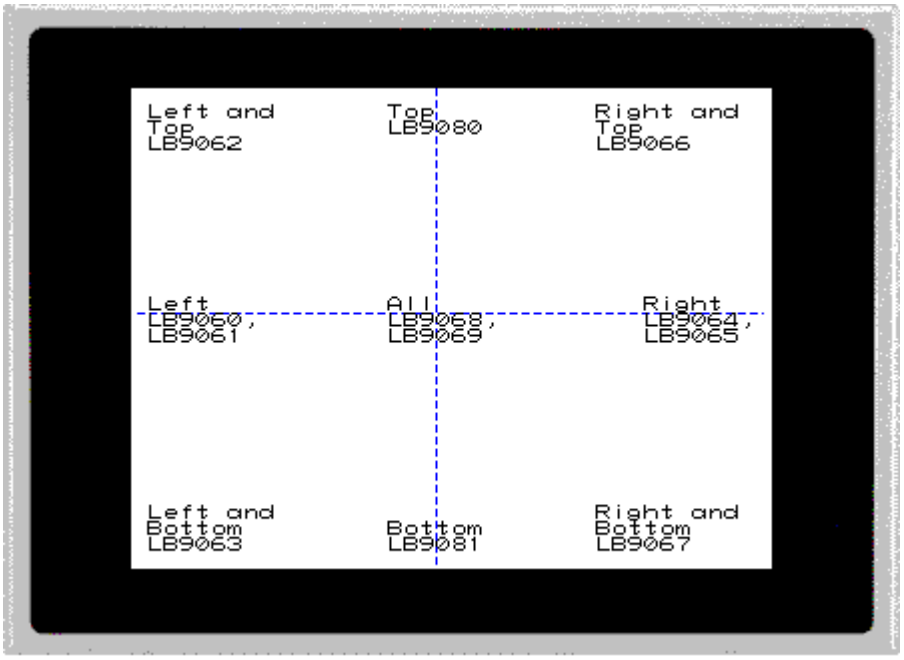
LB Address	Description	NOTE	Version
9050	Toshiba T/C write enable bit. The user: Sets ON to enable writing to T/C bits ON & OFF. Sets OFF to disable T/C writing. **T1/T1S user's manual NOTE**: When writing to Timer/Counter registers, the Timer/Counter's device data should be added to the written data. (2 bytes each, corresponding to the Timer/Counter's register)	When setting the Timer/Counter's device to ON, use '01'; for OFF use '00'. (read/write)	Ver 1.5
9051	Enable or Disable the touchscreen when the **Backlight** is turned OFF. The user: Sets ON to disable touchscreen when **Backlight** is turned OFF. Sets OFF to keep touchscreen enabled when **Backlight** is turned OFF.	OFF is the default mode. (read/write)	Ver 1.6
9052	Write back enable **PLC Control, Change window.** The user: Sets ON to disable write back to PLC. Sets OFF to enable write back to PLC.	This applies to Change Window control only. (read/write)	Ver 1.6
9055	**Disconnect action** – **PLC** communications. The user: Sets ON to continuously retry any write to PLC command. Sets OFF to stop any write to PLC commands.	When HMI is disconnected from the PLC, it acts according to the state of this local bit 9055. (read/write)	Ver 1.6
9056	**Disconnect action** –**Touchscreen** The user: Sets ON to enable touchscreen. Sets OFF to disable touchscreen.	When HMI is disconnected from the PLC, it acts according to the content of this local bit 9056. (read/write)	Ver 1.6

Bits LB9060 ~ 9069, 6080 and 6081 are used for detecting Numeric Input Extend and ASCII Input Extend presses. See the following page for Touchscreen map.

9070	**MITSUBISHI J2-S10** driver control Effects local data being added to 'R' or subtracted from 'R'. Set bit ON to disable add/subtract operations Set bit OFF to enable add/subtract operations Valid range: 0x00800000 to 0x7FFFFFFF (8388608 to 2147483647 decimal) Invalid range: 0xFF799999 to 0x80000000 (-8388608 to –2147483648 decimal).	Due to the protocol limitation of J2-S100 for 'R' registers. A value between 0x00800000 and 0xFFFFFFFF(inclusive) cannot be written to R because it creates an error. (read/write)	Ver 1.6
9071	**MITSUBISHI J2-S10** driver control Write options for 'R'. The user: Sets bit ON to write to EPROM. Sets bit OFF to write to RAM.(default)	(read/write)	Ver 1.6
9090	**Event Log Clear** The user: Sets bit ON to write to clear entries from the Event Log. This includes entries stored in RW memory, if enabled.	After the Event log is cleared, this bit auto resets to OFF. (read/write)	Ver 2.5.2
9091	**Adjusts contrast** lighter one shade. The user: Sets bit ON to activate.	After the contrast is made lighter, this bit auto resets to OFF. Hardware Version 4.5 only.(read/write)	Ver 2.6.0
9092	**Adjusts contrast** darker one shade. The user: Sets bit ON to activate.	After the contrast is made darker, this bit auto resets to OFF. Hardware Version 4.5 only.(read/write)	Ver 2.6.0

LB Address	Description	NOTE	Version
9100~9227	**PLC address/node communication** status. OFF: Communications timed out ON: Communications are good	These bits correspond to the PLC Station Numbers 0~127. The corresponding bit changes to 0 when communication times out. Write 1 to resume communications. (read/write)	Ver 2.6.0
9228~9355	**AUX address/node communication** status OFF: Communications timed out ON: Communications are good	These bits correspond to the AUX. Station Numbers 0~127. The corresponding bit changes to 0 when communication times out. Write 1 to resume communications. (read/write)	Ver 2.6.0
9360	**CF status** OFF: CF not installed ON: CF installed	(read only)	Ver 2.7.0
9361	**Controls CF card Recipe download** ON to OFF: stops download action OFF to ON: starts recipe download from CF	After recipe download, LB9361 stays ON until CF card is unplugged. (read/write)	Ver 2.7.0

9060	**Keypad control** bit, left side (of window) Bit forced ON whenever a user actives an input data object (NI or AI). Bit forced OFF when entering valid data or ESC key is pressed.	User can use this bit to control a Direct window Keypad popup. Keypad window is closed if input succeeds. (read only)	Ver 1.6
9061	Keypad control bit, left side	See note for 9060. (read only)	Ver 1.6
9062	Keypad control bit, left and top side	See note for 9060. (read only)	Ver 1.6
9063	Keypad control bit, left and bottom side	See note for 9060. (read only)	Ver 1.6
9064	Keypad control bit, right side	See note for 9060. (read only)	Ver 1.6
9065	Keypad control bit, right side	See note for 9060. (read only)	Ver 1.6
9066	Keypad control bit, right and top side	See note for 9060. (read only)	Ver 1.6
9067	Keypad control bit, right and bottom side	See note for 9060. (read only)	Ver 1.6
9068	Keypad control bit, all side	See note for 9060. (read only)	Ver 1.6
9069	Keypad control bit, all side	See note for 9060. (read only)	Ver 1.6
9080	Keypad control bit, top side	See note for 9060. (read only)	Ver 2.0
9081	Keypad control bit, bottom side	See note for 9060. (read only)	Ver 2.0



Reserved Local Words

LW Address	Description	NOTE	Version
9000	Retentive memory **Index** base	RBI and RWI use this as an index offset when accessing retentive data. (read/write)	Ver 1.2
9002-9003	Set to **Numeric Input Maximum** value when numeric input gets the focus.	Numeric Input loads its maximum value when activated. When Numeric Input loses the focus, it is set to zero. (read only)	Ver 1.4
9004-9005	Set to **Numeric Input Minimum** value when numeric input gets the focus.	Numeric Input loads its minimum value when activated. When Numeric Input loses the focus, it is set to zero. (read only)	Ver 1.4
9006	**Message board mode** 0: pen 1: brush 2: clipping	Message board use (read)	Ver 1.4
9007	**Pen width** 0:1 pixel 1:2 pixel 2:3 pixel	Message board use (read)	Ver 1.4
9008	**Pen color** 0-255	Message board use (read/write)	Ver 1.4
9010	**Local second**	BCD code, valid values: 0 ~ 59 (read/write allow)	Ver 1.2
9011	**Local minute**	BCD code, valid values: 0 ~ 59 (read/write allow)	Ver 1.2
9012	**Local hour**	BCD code, valid values: 0 ~ 23 (read/write allow)	Ver 1.2
9013	**Local day**	BCD code, valid values: 1 ~ 31 (read/write allow)	Ver 1.2
9014	**Local month**	BCD code, valid values: 1 ~ 12 (read/write allow)	Ver 1.2
9015	**Local year**	BCD code, valid values: 0 ~ 9999 (read/write allow)	Ver 1.2
9016	**Local day of the week**	BCD code, valid values: 1 ~ 7 (read/write allow)	Ver 1.2
9020	**Object queue status** This holds the total number of objects of all the windows on the display. (Each window can hold up to 500 objects.)	If a screens object queue exceeds 1000, then the HMI screen is too complex. The HMI is in danger of reporting a Severe System Error due to low system resources.	Ver 1.4
9034-9035	**System time** (unit as 0.1 second)	Starts at 0 when project started. (read/write)	Ver 1.4
9040-9041	Window **Security password** This word must contain the password for access to secure windows.	Double word (write only)	Ver 1.6
9042	**Security level** The current active security level	(read only)	Ver 1.6
9043	**Force security level** Set to 0 (Lowest) or 1 (Middle).	A security level can only be forced to a lower level than is active. (write only)	Ver 1.6

LW Address	Description	NOTE	Version
9044	**Touch process mode** There are three operational modes to handle momentary switches. They are based on the current value of LW9044. Use a SET WORD of "Set on window open" in the Common window to configure the desired operation mode. **0:** Window popup operation is enabled during touch down and up, at touch up the BIT previously set ON is set OFF, even if a popup window hides the momentary switch. (default initial value) **1**: Window popup operation is disabled during touch down and up. **2:** Window popup operation is enabled during touch down and up. Therefore, if the momentary switch is hidden by a popup window, on touch up, the BIT is not reset.	This modification is to resolve a software constraint in older versions. When a momentary switch is pressed, (touch down) the related bit is set ON. If there is any popup window that hides the momentary switch before it is released, the bit remains ON even if released (touch up). (read/write)	Ver 1.6
9050	**Base Window Id**	Slave HMI can use this word to show the same screen as the Master.	Ver 1.2
9051	Reserved for **Base Window ID** write back operations by a slave HMI. (See LW9050)	PLC control/Change screen writes back to 9051, so it is reserved for that purpose.	Ver 1.2
9054	**Report printout option**, print out: **0**: Text, Meters and Trends **1**: Text, Meters, Trends and Shapes but not patterns **2**: Text, Meters, Trends and Bitmaps **3**: Text, Meters, Trends, Bitmaps and Shapes but not patterns **4**: All	Use this to change the attributes of a PLC Control/ Report printout assignment. (read/write)	Ver 1.5
9055	**PLC Control word Offset** There are two options in the PLC Control object that use this local word: **Change window**, and **Report printout**. The value in this word is added to the controlling data as an offset. Before writing back, the HMI subtracts this value from the data.	Use this to offset window numbers coming from the PLC. Example: A PLC Control / Change window uses D10. If (LW9055) = 10, and D10 = 4 then the HMI changes to window 14. After changing, the HMI writes back 4 to D11. (read/write)	Ver 1.6
9057	**EventLog** DataBase Item size Management information, the size of every item	Use when storing the Event Log in retentive memory. (read only)	Ver 2.1
9058-9059	**EventLog** DataBase size Management information, the size of the DataBase, the size includes management information. (total_item * item_size) + (management_info_size)	Use when storing the Event Log in retentive memory. (read only)	Ver 2.1
9060-9075	Holds **Numeric and ASCII Input**, input data. 9075 holds the least significant digits.	(read/write)	Ver 1.4

LW Address	Description	NOTE	Version
9080-9085	**Project name**	Use ASCII Data to show project name It occupies 12 bytes. (read only)	Ver 1.5
9086-9087	**Project size** in bytes	Use Numeric Data to show (In Decimal) (read only)	Ver 1.5
9088-9089	**Project size** in K bytes	Use Numeric Data to show (In Decimal) (read only)	Ver 1.5
9090-9091	**Compiler version ID**	Use Numeric Data to show (In Decimal) (read only)	Ver 1.5
9092	Project **Compile Date/Year**	Use Numeric Data to show (In Decimal) (read only)	Ver 1.5
9093	Project **Compile Date/Month**	Use Numeric Data to show (In Decimal) (read only)	Ver 1.5
9094	Project **Compile Date/Day**	Use Numeric Data to show (In Decimal) (read only)	Ver 1.5
9100	**Indirect Addressing,** For external PLC only	9100 indirect window number	Ver 1.6
9101	**Indirect Addressing,** For external PLC only	9101 indirect offset	Ver 1.6
9130	**Language control word**	Use this to change the displayed language state for all labels. The range is 0~3. (read/write)	Ver 2.5
9135	**Li-Battery Voltage in millivolts** **Note:** This is not the PLC's battery. It is the touchscreen's internal battery.	Only displayed after download. Not available in Simulation modes. Hardware Version 4.5 only. The range is 0~1228 which is scaled from 0~3V. If the LW9135 < 1126 (2.75V), change the Li-battery. (read only)	Ver 2.6.0
9136	**CF card download status** 0: inactive 1: download in progress 2: download complete 3: download failed	(read only)	Ver 2.7.0

Retentive memory

The HMI units have 64K of battery backed RAM. This memory is accessed by using the following data types:

RB - accesses the first 2047 registers as 16 bit groups. The bit is designated as a hexadecimal number. (i.e. accessing bit 10 of word 63 would be Device type RB, Device address 63A)

RBI - accesses the first 2047 register's bits and sets the index pointer to that bit. LW9000 is used in conjunction with the RBI value to give an offset value for Recipe Transfer parts. (i.e. If RBI is set to device address 20 and LW9000 has a value of 5 in it, then bit downloads and saves would begin at RB25 = RBI20 + 5.)

RW - accesses the retentive registers as words. The full range (0 to 65535) is available but registers above 60000 are reserved for system use (See below).

RWI - Reads the register and sets the index pointer to the value in that register. LW9000 is used in conjunction with the RWI value to give an offset value for Recipe Transfer parts. See Recipe Transfer Part for an example of the RWI register is used. The valid range of RWI types is 0~ 32767.

Ms_RB and **Ms_RW** are used by Slave configured units for accessing retentive memory locations in a remote Master unit.

NOTE: All retentive data types overlap in retentive memory. (i.e. changing RB0002 to ON changes the value of RW00001. This also affects RWI00001 and RBI0002.)

Some Retentive Words are reserved for special purposes. Users should not use these areas except for their specified purposes. Retentive Words: 60000~65535 are reserved

Reserved Retentive Word

RW Address	Description	NOTE	Version
60000	**Real Time Clock second**	BCD code, valid values: 0 - 59 (read/write allow)	Ver 1.2
60001	**Real Time Clock minute**	BCD code, valid values: 0-59 (read/write allow)	Ver 1.2
60002	**Real Time Clock hour**	BCD code, valid values: 0-23 (read/write allow)	Ver 1.2
60003	**Real Time Clock day**	BCD code, valid values: 1-31 (read/write allow)	Ver 1.2
60004	**Real Time Clock month**	BCD code, valid values: 1-12 (read/write allow)	Ver 1.2
60005	**Real Time Clock year**	BCD code, valid values: 0-9999 (read/write allow)	Ver 1.2
60006	**Real Time Clock day of the week**	BCD code, valid values: 1-7 (read/write allow)	Ver 1.2
NOTE about RTC: When using "Objects" to display and change system time, the user must take care to enter only valid values. For example: Seconds cannot be changed to 78(BCD), if 78 (BCD) is entered, the RTC continues counting 78 79 80 ... etc. This causes unpredictable conditions to happen.			

System Information

System Parameter mapping to recipe card information. When a project is downloaded to a unit and run for the first time, System Parameters are stored in the System Reserved Memory area. The following is a list of the mapping relationship.

Parameters from the General Tab

RW	System Parameter	NOTE	Version
60061	**Back light saver**	0 (Disable) 1~255 second (Enable)	Ver 2.1
60064	**Buzzer**	0:None 1:Yes	Ver 2.1

Parameters from the Security Tab

RW	System Parameter	NOTE	Version
60071	**Security Control:**	0:None 1:Yes	Ver 2.1
60072	**Password: level 0**	two words	Ver 2.1
60074	**Password: level 1**	two words	Ver 2.`
60076	**Password: level 2**	two words	Ver 2.`