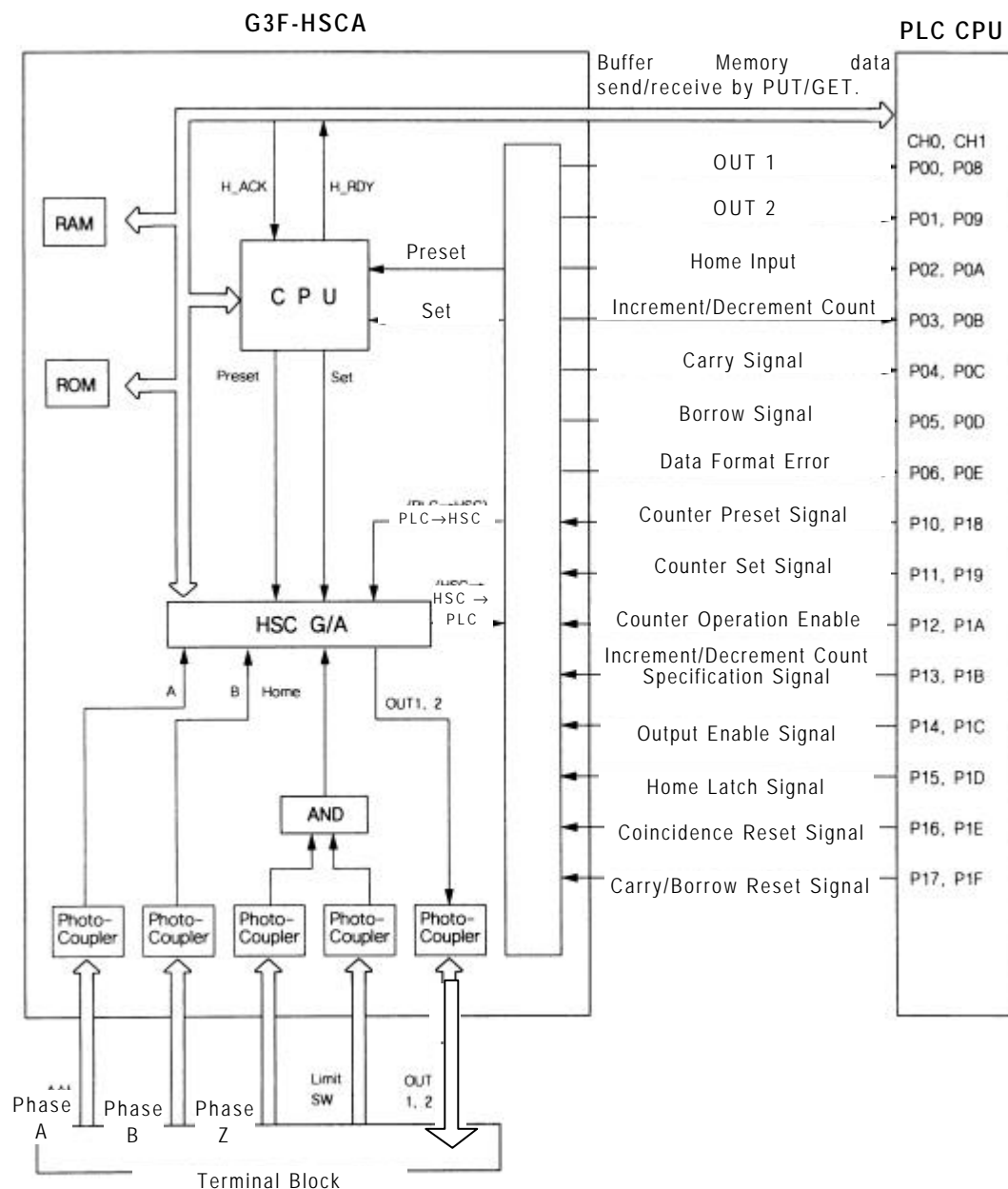


6.1 Operating block diagram

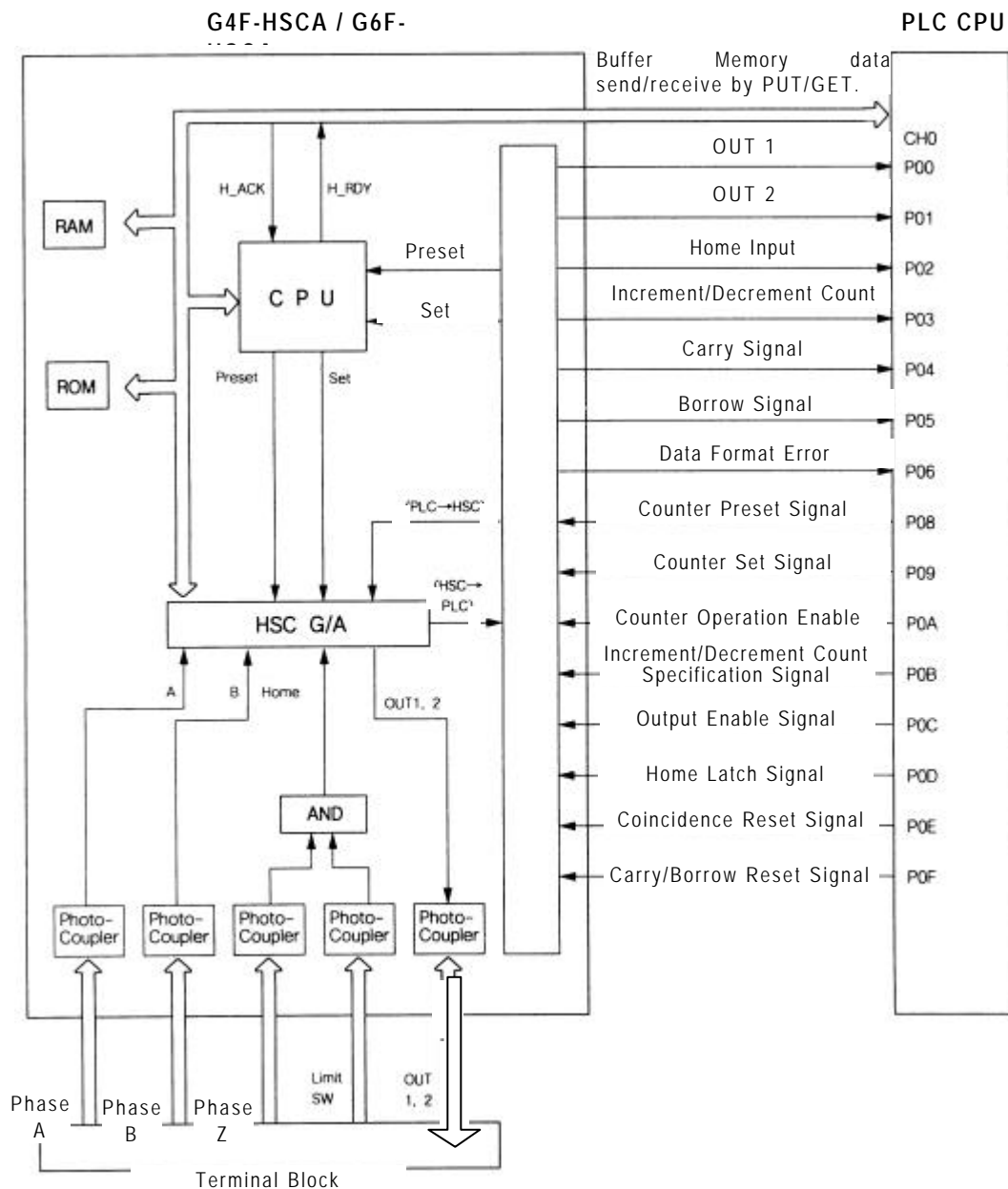
1) G3F-HSCA



The above shows the operation block diagram where the I/O word number of the G3F-HSCA is

0

2) G4F-HSCA / G6F-HSCA



The above shows the operation block diagram where the I/O word number of the G4F-HSCA / G6F-HSCA is 0.

6.2 Input / Output signal configuration

6.2.1 G3F-HSCA

1) Input signals: PLC CPU module ← High Speed Counter module

Signal	Contents	Remarks
P(N)0	OUT 1	Channel 0
P(N)1	OUT 2	
P(N)2	Home Input Signal	
P(N)3	Increment/Decrement Count Signal (1:Up, 0:Down)	
P(N)4	Carry Signal	
P(N)5	Borrow Signal	
P(N)6	Data Format Error	
P(N)7	Unused	
P(N)8	OUT 1	Channel 1
P(N)9	OUT 2	
P(N)A	Home Input Signal	
P(N)B	Increment/Decrement Count Signal (1:Up, 0:Down)	
P(N)C	Carry Signal	
P(N)D	Borrow Signal	
P(N)E	Data Format Error	
P(N)F	Unused	

' N ' means the I/O word number of the High Speed Counter module.

2) Output signals: PLC CPU module → High Speed Counter module

Signal	Contents	Remarks
P(N+1)0	Counter Preset Signal	Channel 0
P(N+1)1	Counter Set Signal	
P(N+1)2	Counter operation enable signal	
P(N+1)3	Increment/decrement count specification signal	
P(N+1)4	Output enable signal	
P(N+1)5	Home Latch enable signal	
P(N+1)6	Coincidence rest signal	
P(N+1)7	Carry/Borrow Reset Signal	
P(N+1)8	Counter Preset Signal	Channel 1
P(N+1)9	Counter Set Signal	
P(N+1)A	Counter operation enable signal	
P(N+1)B	Increment/decrement count specification signal	
P(N+1)C	Output enable signal	
P(N+1)D	Home Latch enable signal	
P(N+1)E	Coincidence rest signal	
P(N+1)F	Carry/Borrow Reset Signal	

‘ N ’ means the I/O word number of the High Speed Counter module.

6.2.2 G4F-HSCA / G6F-HSCA

Signal	Contents	Remarks
P(N)0	OUT 1	Input Signals (PLC ← HSC)
P(N)1	OUT 2	
P(N)2	Home Input Signal	
P(N)3	Increment/Decrement Count Signal (1:Up, 0:Down)	
P(N)4	Carry Signal	
P(N)5	Borrow Signal	
P(N)6	Data Format Error	
P(N)7	Unused	
P(N)8	Counter Preset Signal	Output Signals (PLC → HSC)
P(N)9	Counter Set Signal	
P(N)A	Counter operation enable signal	
P(N)B	Increment/decrement count specification signal	
P(N)C	Output enable signal	
P(N)D	Home Latch enable signal	
P(N)E	Coincidence rest signal	
P(N)F	Carry/Borrow Reset Signal	

‘ N ’ means the I/O word number of the High Speed Counter module.

6.2.3 Functions of I/O Signals

1) Input Signals

OUT 1

A data among ' > ' , ' = ' and ' < ' is selected and if the current comparison result conforms to the selected data this input signal will be set to high (On).

OUT 2

A data among ' > ' , ' = ' and ' < ' is selected and if the current comparison result conforms to the selected data this input signal will be set to high (On).

Home Input Signal

If the Home signal is inputted, this signal will be set to high (On). That is, this signal will be set to high if the both of the limit switch signal and phase Z signal are turned On when the Home Latch enable signal turns On. This signal will be set to low if the Home Latch signal turns Off.

Increment/Decrement Count Signal

This signal turns On if increment counting is being performed in present, and turns Off if decrement counting is being performed.

Carry Signal

If the current count value is ' 16,777,215 ' and increments by one pulse, the current value becomes ' 0 ' and the carry signal turns On.

Borrow Signal

If the current count value is ' 0 ' and decrements by one pulse, the current value becomes ' 16,777,215 ' and the borrow signal turns On.

Data Format Error

If a value of Preset, Set or Out data exceeds the input range, this signal turns On. If a normal data value is inputted it turns Off.

2) Output Signal

Counter Preset Signal

This signal makes the high speed counting module process the counter initial set value(Preset value) written in the Buffer Memory (CH0: addresses 0 and 1, CH1: addresses 10 and 11). Only one pulse has to be turned On.

Counter Set Signal

This signal makes the high speed counting module process the current value written in the Buffer Memory (CH0: addresses 2 and 3, CH1: addresses 12 and 13) and the set value(SET value) which will be compared with it.

Counter operation enable signal

This signal should be turned On in order that the high speed counting module start counting by the pulse input. If this signal turns Off, the high speed counting module does not execute counting.

Increment/decrement count specification signal

When the increment/decrement mode is the program mode at 1-phase pulse inputs, Decrement count will be proceeded if this signal is turned On. Increment count if Off. (See 5) of section 4.2)

Output enable signal

Turn this signal On to allow the terminal block(or external connector) output signals (OUT1 and OUT2) to be outputed.

Home Latch enable signal

If this signal is turned On and phase Z and L/S inputs turns On, then the Home input signal turns On and the current value will be reset(000000).

Coincidence Reset Signal

Turns this signal On to reset the signal ' current value = set value' .

Carry/Borrow Reset Signal

When a Carry or Borrow signal has occurred, this signal is used to reset it.

6.3 Buffer memory configuration

The high speed counting module has a Buffer Memory for data write/read to/from the PLC CPU. The PUT and PUP instructions write data from the PLC CPU to the Buffer Memory. The GET and GETP instructions read data. (Refer to the Manuals relating to the instructions.)

The followings explain the structure of the Buffer Memory and the data configuration.

6.3.1 Buffer memory configuration

G3F-HSCA Buffer Memory

Address (Decimal)		
0000	Preset Value(Lower)	Channel 0
0001	Preset Value(Upper)	
0002	Set Value(Lower)	
0003	Set Value(Upper)	
0004	Out Data	
0005	Current Value (Lower)	
0006	Current Value	

Address (Decimal)		
0010	Preset Value(Lower)	Channel 1
0011	Preset Value(Upper)	
0012	Set Value(Lower)	
0013	Set Value(Upper)	
0014	Out Data	
0015	Current Value (Lower)	
0016	Current Value	

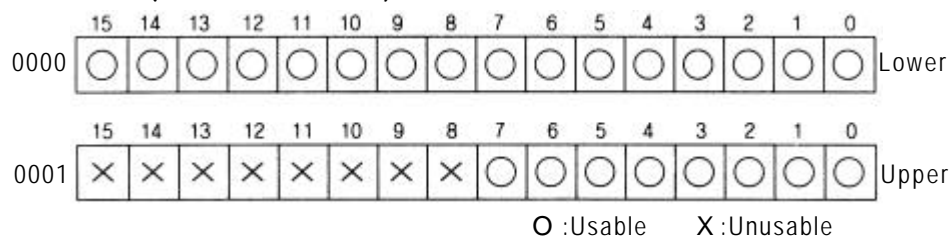
G4F-HSCA / G6F-HSCA Buffer Memory

Address (Decimal)		
0000	Preset Value(Lower)	Channel 0
0001	Preset Value(Upper)	
0002	Set Value(Lower)	
0003	Set Value(Upper)	
0004	Out Data	
0005	Current Value (Lower)	
0006	Current Value	

6.3.2 The contents and data configuration of buffer memory

The followings explain them in reference with the channel 0. For the channel 1, only address is different and contents are same as the channel 0.

(1) Preset Value (Addresses 0 and 1)



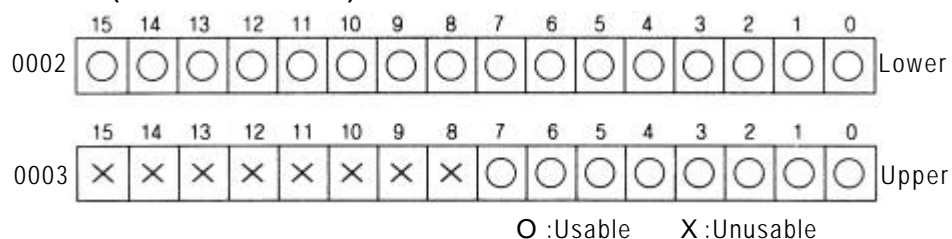
Used to store the preset value from which count starts.

The preset value setting range is 0 to h00FFFFFF(16,777,215 as decimal). Up to h00FF(bits 0 to 7) will be stored to the upper address (address 0001) and up to hFFFF(bits 0 to 15) to the lower address (address 0000). If a value is stored to the upper bits 8 to 15(exceeds the preset value setting range), the input signal P(N)6 turns On.

For the channel 1, the upper address is 0011 and the lower address 0010. If the preset value exceeds the setting range the input signal P(N)E turns On.

If a preset value exceeds the setting range, the ERR LED flickers with 0.5 sec cycle.

(2) Set Value (Addresses 2 and 3)



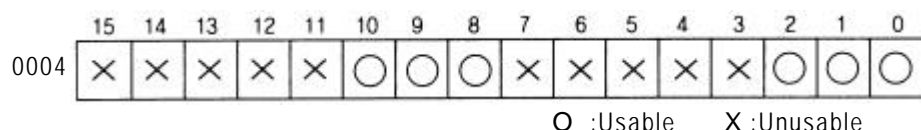
Used to store the set value which will be compared with the current count value.

The set value setting range is 0 to h00FFFFFF(16,777,215 as decimal). If the set value exceeds the setting range, the input signal P(N)6 turns On.

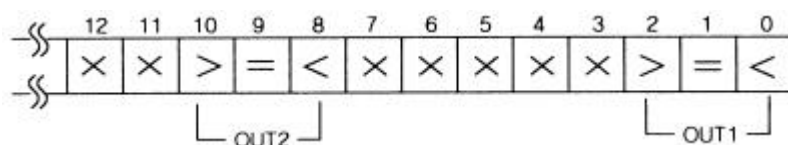
For the channel 1, the lower address is 0012 and the upper address 0013. If the set value exceeds the setting range the input signal P(N)E turns On.

If a set value exceeds the setting range, the ERR LED flickers with 0.5 sec cycle.

(3) Out Value (Address 4)



Only bits 0, 1, 2, 8, 9 and 10 are usable. If other bit is used, the input signal P(N)6 turns On and the ERR LED flickers with 0.5 sec cycle.



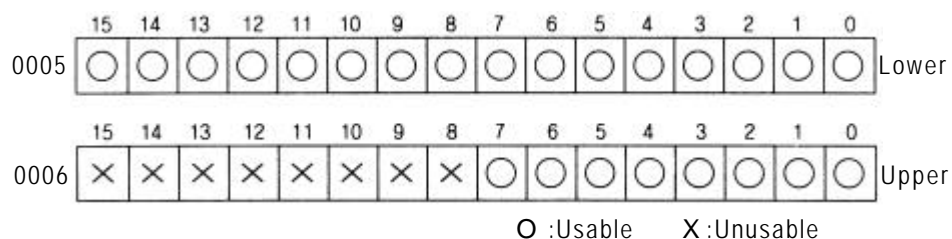
Bit 0 On : If current count value < set value, OUT1 will be turned On. (output enable)
 Bit 1 On : If current count value = set value, OUT1 will be turned On. (output enable)
 Bit 2 On : If current count value > set value, OUT1 will be turned On. (output enable)
 Bit 8 On : If current count value < set value, OUT2 will be turned On. (output enable)
 Bit 9 On : If current count value = set value, OUT2 will be turned On. (output enable)
 Bit 10 On : If current count value > set value, OUT2 will be turned On. (output enable)
 Bits 0, 1 and 2 can be used in combination.

[Example]

Bits 1 and 2 On : If current count value \geq set value, OUT1 will be turned On. (output enable)
 Bits 0 and 1 On : If current count value \leq set value, OUT1 will be turned On. (output enable)
 Bits 0 and 2 On : If current count value \neq set value, OUT1 will be turned On. (output enable)
 If bits 8, 9 and 10 are used in combination as shown above, the results same as above will be output to the OUT2.

In relation to the channel 1, the address is 0014.

(4) Current Count Value (Addresses 5 and 6)



If the counter operation enable signal turns On, the current count value to pulse inputs will be stored to these addresses.

The input range is 0 to h00FFFFFF(16,777,215 as decimal). During increment counting, if the current count value is h00FFFFFF and next pulse input has been received, it changes into h00000000 and occurs a Carry. During decrement counting, if the current count value is h00000000 and next pulse input has been received, it changes into h00FFFFFF and occurs a Borrow.

If a Carry occurs, the P(N)4 will turn On for the CH0 and the P(N)C for the CH1.

If a Borrow occurs, the P(N)5 will turn On for the CH0 and the P(N)D for the CH1.

In relation to the channel 1, the addresses are 0015 and 0016.