Communication

MODEL : KBV - 5100

TYPE : VTS

APPLI' : Russia

DATE : '05. 1. 5.

KOCOM

VIP Bldg 4th FL #216-1 Songjuk-Dong Jangan-Ku Suwon-City Kyungki-Do Korea

Tel : 82 - 31 - 257 - 8051/2 Fax : 82 - 31 - 257 - 8053

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1. Contents

Serial Interface

a. Baud Rate : 4800 bps

b. Communication Type : Half Duplex

c. Sync Type : ASYNC

d. Voltage : DC24V

e. Data Frame : 1 Start Bit

8 Data Bit

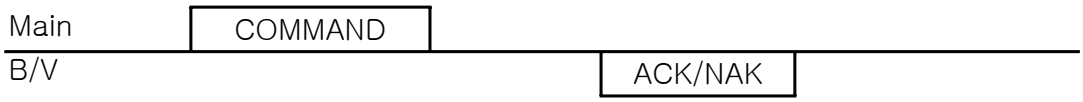
1 Parity Bit (Even)

1 Stop Bit

2. Communication order

(1) Command Communication

When letting B/V be the condition of Main Control Part or do the specific operation



1. Command : B/V's Designation and Command Contents
2. ACK : When normally receipt of Command
3. NAK : The reply in case of not being able to receive the Command

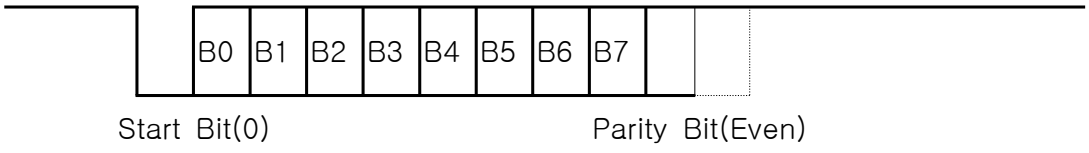
(2) Sending Data Communication

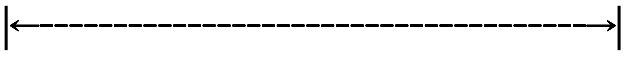
When sending various kinds of Data to B/V.

(3) Receiving Data Communication

When sending various kinds of Data to Main.

(4) Bit Composition Of 1 Character

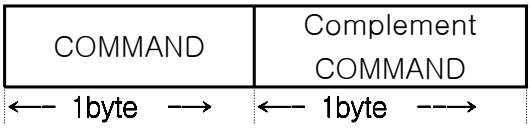




◆ 1Bit's time : 208.0μs ± 2%

3. Composition of Command

(1) Composed of 2 characters



(2) To prevent error, the second sends Complement Command

(3) Contents of Command

Command (HEX)	Command (HEX)	Designation	Description
58	A7	Standby	Becomes stand-by condition
59	A6	All data Requesting	Transmitting all data
5A	A5	Input Requesting	Transmitting change data
5B	A4	Output Command	Operate based on data
5C	A3	Re-Input Requesting	Re-send Input demand and collective demand
5D	A2	Output Re-Command	Re-receive Output Command

4. Composition of Data

When Data Command is one kind

BC	DC	DATA	FCC
①	②	③	④

① BC : Byte counter (Composed of 1Byte)
Indicate Byte number totaling Data Command and Data Byte number (HEX)

② DC : Data Command (Composed of 1 Byte)
Indicate the kind of data

③ DATA : Composed of N byte (N=1,2,3,.....)
Real sending / receipt Data

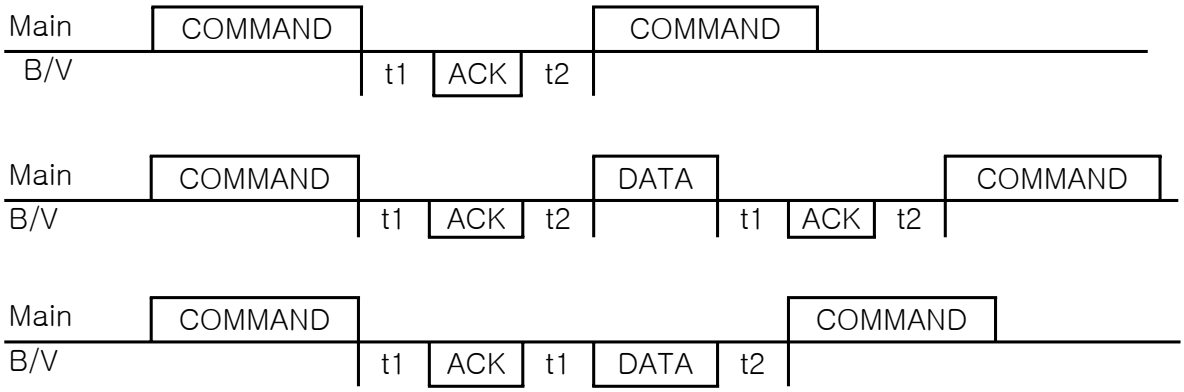
④ FCC : Frame check code (Composed of 1 Byte)
Formula --- Applies LRC (Include BC, Exclusive OR)
FCC = BC ⊕ DC ⊕ DATA

5. Composition of ACK/NAK

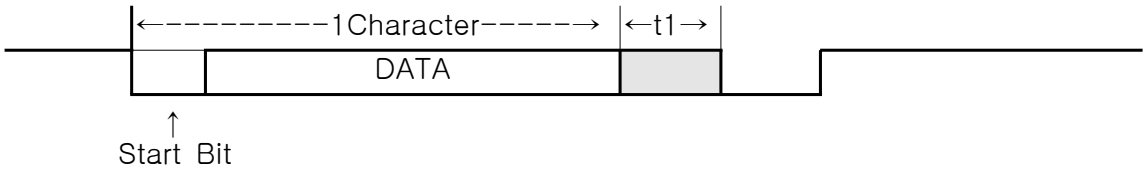
(1) 1 Byte
(2) Contents of ACK/NAK Code

CODE (HEX)	Name	Description
11	ACK1	ACK from under ACK2 and except ACK5
22	ACK2	When transmitting 1 kind of data
33	ACK3	When transmitting more than 2 kinds
44	ACK4	When receiving of Command except Stand-by after start
55	ACK5	When refusing of Output Re-Command
EE	NAK	When being unable to receive command or Data

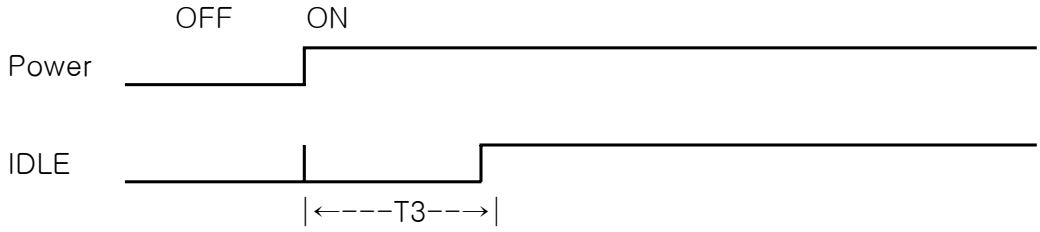
6. Time Chart



(1) Character Interval



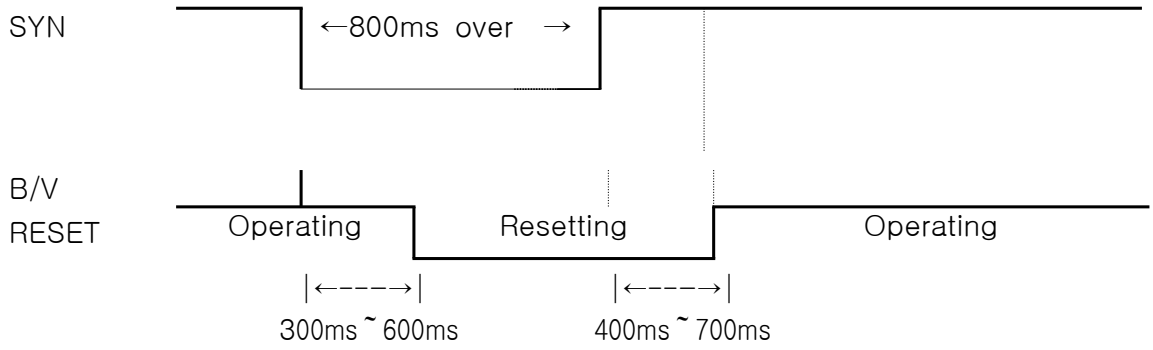
(2) Time of Initial Mode After Power ON



T1 : 100μs ~ 2ms
T2 : 600μs over
T3 : 50ms under

7. The Mothod of Resetting B/V

In case of SYN's signal is "Low" for the specified period serially, do forcible reset in hardware. The decontrol of reset's term is to return SYN signal "High"

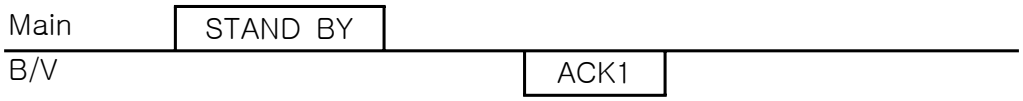


8. THE DETAIL KIND OF COMMUNICATION

1) Communication Flow

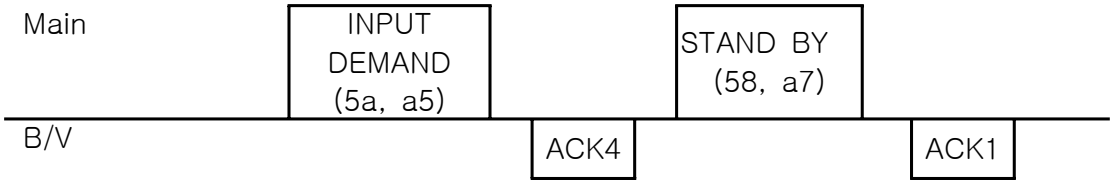
(1) When power is on

When B/V receive Standby Command(58,A7)m It send ACK1



(2) Reset in operation

After do reset, B/V sends ACK4 when it receives Command except Stand-by.



(3) When receipt of Output Command(5B, A4).

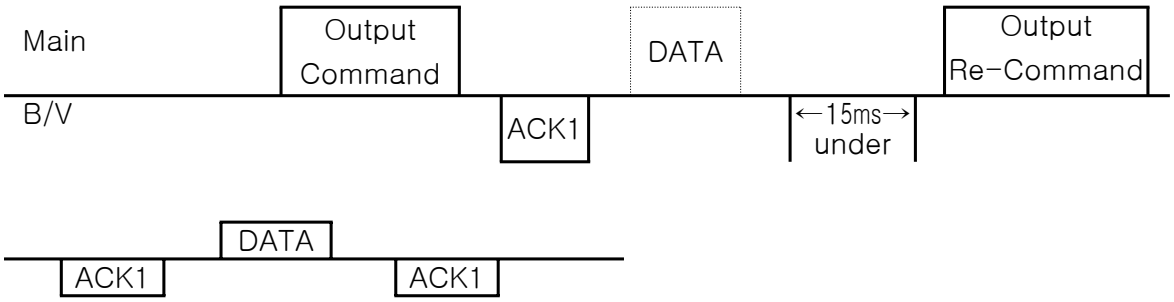
B/V's operation is done according to Data after receiving Output Command.

(4) When there is an error in Output Command Communication

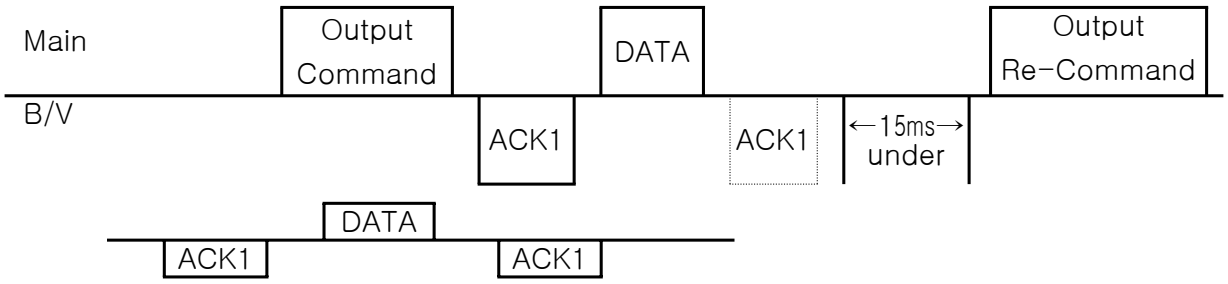
① Main re-sends Output Command

When it can't receive ACK1 normally after sending Output Command

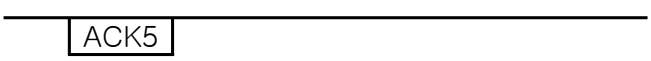
② When B/V can't receive Data normally, It doesn't send ACK1.
When Main can't receive ACK1 after sending Data,
It sends Data after it sends Output Re-Command.



③ When Main can't receive ACK1 after sending Data,
It sends Data after it sends Output Re-Command.

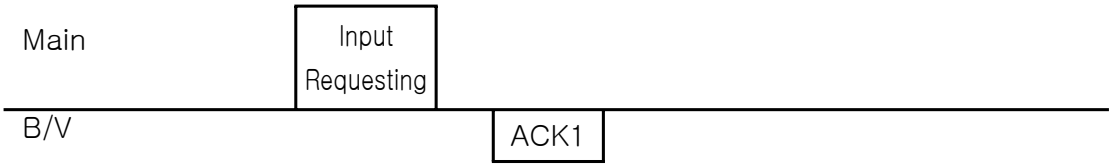


■ *However, When B/V Receives Data normally, It sends ACK5.*
When Main receives ACK 5, Don't re-send Data.

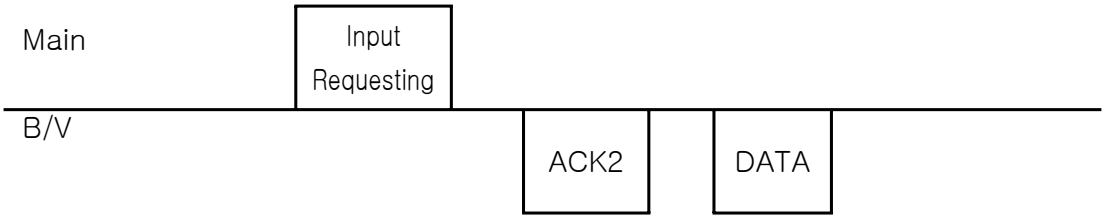


(5) When receiving Input request Command(5A, A5).
When receiving Input request Commend,
There are three kinds of Communication according to the condition of B/V.

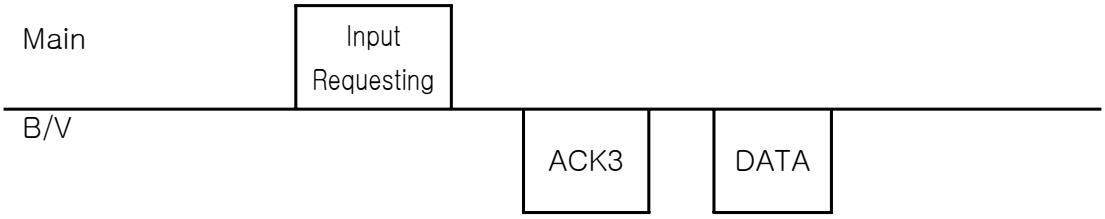
① When there is not conditional change
When the previous Input request Communication and condition is not changed, return ACK1.



② When conditional change is 1 kind and Data Command Unit,
It sends ACK2 and Data.



③ When conditional change is more than 2 Kinds and Data Commend unit,
It sends ACK3 and Data.

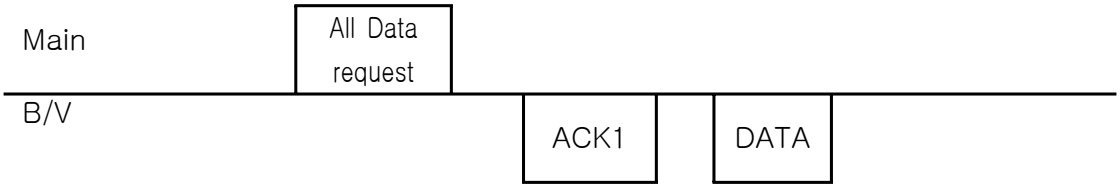


■ *Content of Data Frame (When Data is more than 2 kinds)*

BC	BC1	DC1	DATA1		BCn	DCn	DATAn	FCC

BC1 ~ BCn : Byte counter of each data

(6) When receiving all Data request Command(59, A6)
When receiving all Data request Command, Return ACK1 and send all Data.



■ *Content of Data Frame (When Data is more than 2 kinds)*

BC	BC1	DC1	DATA1		BC6	DC6	DATA6	FCC

Bc1 ~ Bcn : Byte counter of each Data

9. Data Command의 일람표

Direction	COMMAND Name	DATA COMMAND(HEX)	Description	DATA BYTE Number
Main ⇓ B/V	B/V Control	10	B/V Control Data	2
	Return	11	Return Data	4
B/V ⇓ Main	Insertion count	18	Inserted Bill Data	4
	Change count	19	Changable Bill Data	4
	Returned count	1A	Returned Bill Data	4
	B/V's Status	1B	B/V's Status Data	3
	B/V's Error	1C	B/V's Error Data	2
	Version	1D	B/V Version No	2
	GIFT ※	1E	GIFT Data	5

※ Data Command "1E", GIFT Data is not used.

10. Detail description of Data Command

(1) B/V Control

		MSB							LSB	
DC		0	0	0	1	0	0	0	0	← 10(Hex)
Data	1 Byte	×	④	③	×	×	×	②	①	
	2 Byte	×	×	×	×	×	×	×	×	

① Bill insert enable
I : Bill insert is available.
O : Bill insert is not available.
② Inserted Bill count Clear
I : Clear the inserted bill count and stack the inserted bill.
O : meaningless
③ 10 Rubble enable
I : 10 Rubble bill is availble.
O : 10 Rubble bill is not availble.
④ 50 Rubble enable
I : 50 Rubble bill is availble.
O : 50 Rubble bill is not availble.

◆ “X" in the byte is don't cared.
but, used in Parity, FCC.

(2) Return

Command to return the inserted bill.

		MSB							LSB	
DC		0	0	0	1	0	0	0	1	← 11(Hex)
Data	1 Byte	×	×	×	×	×	×	×	×	
	2 Byte	1 Rubble				×	×	×	×	← Value(BCD)
	3 Byte	×	×	×	×	10 Rubble				
	4 Byte	×	×	×	×	×	×	×	×	

◆ ex) to return a piece of 10 Rubble, write "1" in 10 Rubble nibble.

(3) Insertion count

Inserted bill's count.

		MSB							LSB	
DC		0	0	0	1	1	0	0	0	← 18(Hex)
Data	1 Byte	×	×	×	×	10 Rubble count				
	2 Byte	×	×	×	×	50 Rubble count				
	3 Byte	×	×	×	×	×	×	×	×	
	4 Byte	×	×	×	×	×	×	×	×	

◆ Each bill's inserted count is set in BCD format.
This count Data is cleared by "Clear Command".

(4) Change count

Bill's count that would be return.

		MSB							LSB	
DC		0	0	0	1	1	0	0	1	← 19(Hex)
Data	1 Byte	×	×	×	×	10 Rubble count				
	2 Byte	×	×	×	×	50 Rubble count				
	3 Byte	×	×	×	×	×	×	×	×	
	4 Byte	×	×	×	×	×	×	×	×	

◆ Each bill's changable count is set in BCD format.

(5) Returned count

Bill's count that is returned.

		MSB							LSB	
DC		0	0	0	1	1	0	1	0	← 1A(Hex)
Data	1 Byte	×	×	×	×	10 Rubble count				
	2 Byte	×	×	×	×	50 Rubble count				
	3 Byte	×	×	×	×	×	×	×	×	
	4 Byte	×	×	×	×	×	×	×	×	

◆ Each returned bill's count is set in BCD format.
This count Data is cleared by "Clear Command".

(6) B/V Status Data

B/V's status data(except error data)

		MSB							LSB	
DC		0	0	0	1	1	0	1	1	← 1B(Hex)
Data	1 Byte	⑦	⑥	⑤	④	③	②	×	①	
	2 Byte	×	×	×	×	×	×	⑨	⑧	
	3 Byte	×	×	×	×	×	×	×	×	

① Bill accept enable
1 : bill accept is enabled (CREM ON)
0 : bill accept is disabled (CREM OFF)

② When there is no next bill
1 : next bill
0 : except above status
After receive CREM OFF command from main, When there is next inseted bill, then this bit is set.

③ Reject is completed
1 : Reject is completed.
0 : except above status
This bit is cleared by "Clear command".

④ Clear completed
1 : Each insertion bill count, returned count is cleared to "0".
0 : except above status

⑤ Bill validating
1 : When bill is inserted and B/V is validating.
0 : except above status

⑥ Bill stacking
1 : Bill is stacked
0 : except above status

⑦ Bill returning
1 : Bill is returned
0 : except above status

⑧ 10 Rubble is available
1 : 10 Rubble is acceptable
0 : 10 Rubble is not acceptable

⑨ 50 Rubble is available
1 : 50 Rubble is acceptable
0 : 50 Rubble is not acceptable

(7) B/V Error Data

B/V's Error Data

		MSB							LSB	
DC		0	0	0	1	1	1	0	0	← 1C(Hex)
Data	1 Byte	×	×	④	③	×	②	×	①	
	2 Byte	×	×	×	×	×	×	×	×	

① Representative error of B/V
1 : Error on B/V
0 : No error on B/V

② Sensor Error
1 : Error on B/V's sensor
0 : No error on B/V's sensor

③ Bill Jamming
1 : Set when Bill is jammed.
0 : No bill jam
when bill jamming on bill insert, reject and stack.

④ Bill return error
1 : Set when bill return is not completed.
0 : No bill return error

(8) Version

B/V's VERSION and Maker Code

		MSB							LSB	
DC		0	0	0	1	1	1	0	1	← 1D(Hex)
Data	1 Byte	B/V Version								
	2 Byte	Maker CODE								

Version is “00(HEX)".

Maker code is “01(HEX)”.

(9) GIFT

This data is not used.

		MSB							LSB	
DC		0	0	0	1	1	1	1	0	← 1E(Hex)
Data	1 Byte	0	0	0	0	0	0	0	0	
	2 Byte	0	0	0	0	0	0	0	0	
	3 Byte	0	0	0	0	0	0	0	0	
	4 Byte	0	0	0	0	0	0	0	0	
	5 Byte	0	0	0	0	0	0	0	0	

11. Composition of main connector

Terminal No.	Signal	Input and Output	Content
1	+24V	Input	Power (DC)
2	+8V	-	NOT USED
3	—	—	NOT USED
4	SYN	Input	H/W RESET Signal COMMAND SYNC
5	Data IN	Input	B/V receving Data Input
6	Data OUT	Output	B/V sending Data Output
7	—	-	NOT USED
8	GND	Output	GND

Housing : XLR - 08V (JST)