



Date: 4/Aug/1999

Ref: VKC001001

Product: VK-C78ES / VK-C77E

Communication Protocol :-

Communication between the camera's microcomputer and the PC is available by using the RS232 protocol. The microcomputer receives each control command given by the PC and echoes it back to the PC.

[I] RS232C/485 communication protocol for VK-C77E/C78S/C78ES

The transmission parameters are follows

- Data length 8 bit
- Stop bits 1
- Parity even parity
- Baudrate 4800 bps

Following are the explanations how to address and to communication to a specific camera from the cameras which are hanging on RS232C/485 bus line.

The “w” command can transmit the 2byte data.

The “W” command can transmit the 1byte data.

This camera has 2 m-com chips.

The one is the main m-com that controls the main feature of DSP, the another is the sub m-com that controls manually by switches.

(1) Main m-com control :H3042

1. Switch the Auto focus / Manual focus

:WFF0E2X₀ X₀=2: auto X₀=A: manual

2. Move focus to FAR (when manual focus)

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:WFCBBA9      ; start
```

```
:WFCBBFE      ; stop
```

- ### 3. Move focus to NEAR (when manual focus)

```

:WFCBBAA      : start

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RS232 Protocol for VK-C77E/VK-C78ES

- ;WFCBBFE ; stop
4. Move zoom to TELE :WFCBB99 ; start
:WFCBBFE ; stop
5. Move zoom to WIDE :WFCBB9B ; start
:WFCBBFE ; stop
6. Select the zoom speed RAM area
of optical zoom :WFDFCX₁X₀ (X₁X₀=00 : 3sec X₁X₀=08 : 6sec)
7. Set maximum digital zoom EEPROM area (x1: 00 x8: 38)
:WE0F0X₁X₀
8. Set digital zoom RAM area
(x1: 0000 x8: 01C0) :wFC6EX₃X₂X₁X₀ (X₃X₂X₁X₀=0000~01C0 ; 449 step)
9. Move ZOOM position with auto focus
Set Digital Zoom limit :WE0F0X₁X₀
Set TELE limit :wF71EX₃X₂X₁X₀
Move to Tele :WFCBB99
or
Set WIDE limit :wF71CX₃X₂X₁X₀
Move to WIDE :WFCBB9B

Read zoom status :RF75100
If the 5th bit of echo back data is set "1" , stop the moving.
:WFCBBFE
10. Switch NEG/POS picture :WFF0CX₁0 (pos: X₁=0 neg:X₁=C)
C-neg on;X₁=8 off;X₁=0
Y-neg on;X₁=4 off;X₁=0
11. Fade control :WFDfE0X₀ (black fade : X₀=0 white fade : X₀=2)
:WFCBBX₁X₀ (fade in : X₁X₀=A0 fade out : X₁X₀=FE)
12. Zooming fade :WFDF3X₁0 (fade mode on: X₁=2 fade mode off: X₁=0)
:WFDfE0X₀ (black fade: X₀=0 white fade : X₀=2)
:WFCBBX₁X₀ (fade in : X₁X₀=A0 out : X₁X₀=FE)

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13. Set iris level RAM area
EEPROM area :WFD9EX₁X₀ (X₁X₀=0FF: 256 step) 00:close FF:open

:WE09EX₁X₀

14. Set Y-gamma level RAM area
EEPROM area :WFB8X₁X₀ (X₁X₀=001F ;32 step)

15. Set chroma level RAM area
EEPROM area :wFD1AX₃X₂X₁X₀ (X₃=X₂=X₁=X₀=0~F ;16 step)
X₃: AGC gain 0.0~1.0dB
X₂: AGC gain 1.0~12dB
X₁: AGC gain 12.0~17dB
X₀: AGC gain =max AGC

16. Set maximum AGC gain RAM area
EEPROM area :wFD46X₃X₂X₁X₀ (X₃X₂X₁X₀=0000~03FF)
X₃: AGC gain 0.03125dB/step)
X₂: AGC gain 0dB:X₃X₂X₁X₀=0000
18dB:X₃X₂X₁X₀=0240)

17. Set fixed gain select EEPROM area (1.5dB/step)
:WE1F84X₀ (0dB:X₀=0 +10dB:X₀=7)

18. Switch AGC ON/OFF :WFB7FX₁0 (on :X₁X₀=00 off:X₁X₀=80)

19. Switch white balance :WFBFFX₁X₀ (MWB:X₁X₀=08 AWB:X₁X₀=00)

20. Set R gain RAM area
(when it is manual white) :wFBBC0X₂X₁X₀ (X₂=0~7 ;8 step)
(X₁X₀=80~FF ;256 step)
X₂X₁X₀ : 080<—>0FF<—>180<—>1FF<—>280<—>2FF
R GAIN = 2(Y₁₀*2²+Y₉*2¹+Y₈*2⁰+1)
*(Y₇*2⁻¹+Y₆*2⁻²+Y₅*2⁻³+Y₄*2⁻⁴+Y₃*2⁻⁵+Y₂*2⁻⁵+Y₁*2⁻⁷+Y₀*2⁻⁸)

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21. Set B gain RAM area
 (when manual white) :wFBBEX₃X₂X₁X₀ (X₂=8~F ;8 step)
 (X₁X₀=00~FF ;256 step)
 B GAIN = 2(Y₁₀*2²+Y₉*2¹+Y₈*2⁰+1)
 *(Y₇*2⁻¹+Y₆*2⁻²+Y₅*2⁻³+Y₄*2⁻⁴+Y₃*2⁻⁵+Y₂*2⁻⁵+Y₁*2⁻⁷+Y₀*2⁻⁸)

22. Set shutter speed :WFB7FX₁X₀ (X₁X₀=40 manual shutter on)
 (X₁X₀=00 manual shutter off)
 :wFCA8X₃X₂X₁X₀
 :WFCAY₁Y₀ (1/60 : X₃X₂X₁X₀Y₁Y₀=010500)
 (1/100 : X₃X₂X₁X₀Y₁Y₀=009C99)
 (1/120 : X₃X₂X₁X₀Y₁Y₀=008280)
 data = HEX(26260SHUTTER SPEED) (1/250 : X₃X₂X₁X₀Y₁Y₀=003EA3)
 exp. Shutter speed =1/60 (1/350 : X₃X₂X₁X₀Y₁Y₀=002CBD)
 data = HEX(262601/60) (1/500 : X₃X₂X₁X₀Y₁Y₀=001F52)
 (1/750 : X₃X₂X₁X₀Y₁Y₀=0014E1)
 (1/1000 : X₃X₂X₁X₀Y₁Y₀=000FA8)
 (1/1500 : X₃X₂X₁X₀Y₁Y₀=000A70)
 (1/2000 : X₃X₂X₁X₀Y₁Y₀=000714)
 (1/4000 : X₃X₂X₁X₀Y₁Y₀=0003EA)
 (1/10000 : X₃X₂X₁X₀Y₁Y₀=000190)
 (1/30000 : X₃X₂X₁X₀Y₁Y₀=000085)

23. Set horizontal aperture level RAM area
 AGC gain 0.0~1.0dB :WFD29X₁X₀ (X₁X₀=00~1F ;32 step)
 AGC gain 1.0~12dB :WFD2AX₁X₀ (X₁X₀=00~1F ;32 step)
 AGC gain 12.0~17dB :WFD2BX₁X₀ (X₁X₀=00~1F ;32 step)
 AGC gain =max AGC :WFD2CX₁X₀ (X₁X₀=00~1F ;32 step)
 EEPROM area
 AGC gain 0.0~1.0dB :WE029X₁X₀ (X₁X₀=00~1F ;32 step)
 AGC gain 1.0~12dB :WE02AX₁X₀ (X₁X₀=00~1F ;32 step)
 AGC gain 12.0~17dB :WE02BX₁X₀ (X₁X₀=00~1F ;32 step)
 AGC gain =max AGC :WE02CX₁X₀ (X₁X₀=00~1F ;32 step)

24. Set pedestal level
 AGC gain 0.0~1.0dB :WFC00X₁X₀ (X₁X₀=00~7F ;128 step)
 AGC gain 1.0~12dB :WFC01X₁X₀ (X₁X₀=00~7F ;128 step)
 AGC gain 12.0~17dB :WFC02X₁X₀ (X₁X₀=00~7F ;128 step)
 AGC gain =max AGC :WFC03X₁X₀ (X₁X₀=00~7F ;128 step)

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25. Set vertical aperture level RAM area
 AGC gain 0.0~1.0dB :WFD31X₁X₀ (X₁X₀=00~1F ;32 step)
 AGC gain 1.0~12dB :WFD32X₁X₀ (X₁X₀=00~1F ;32 step)
 AGC gain 12.0~17dB :WFD33X₁X₀ (X₁X₀=00~1F ;32 step)
 AGC gain =max AGC :WFD34X₁X₀ (X₁X₀=00~1F ;32 step)
 EEPROM area
 AGC gain 0.0~1.0dB :WE031X₁X₀ (X₁X₀=00~1F ;32 step)
 AGC gain 1.0~12dB :WE032X₁X₀ (X₁X₀=00~1F ;32 step)
 AGC gain 12.0~17dB :WE033X₁X₀ (X₁X₀=00~1F ;32 step)
 AGC gain =max AGC :WE034X₁X₀ (X₁X₀=00~1F ;32 step)
26. Set initialize :WFCAC00
27. Select digital zoom :WFDF2X₁X₀ (X₁X₀=80:SLIM X₁X₀=08:FAT)
 effect (X₁X₀X₀=12 :CLEAR)
28. Change Baudrate :WE05EX₁0 X₁=0 :4800bps/ even parity
 X₁=9 :1200bps/ even parity
 X₁=A :2400bps/ even parity
 X₁=B :9600bps/ even parity
 X₁=C :4800bps/ none parity
 X₁=D :1200bps/ none parity
 X₁=E :2400bps/ none parity
 X₁=F :9600bps/ none parity
29. Memorize Zoom data and Focus data for PRESET (Memorized by PC) ; TYPE I
 Read Digital Zoom position :rFC6E0000 :rFC6EX₃X₂X₁X₀
 Read Optical Zoom position :rF7140000 :rF714N₃N₂N₁N₀
 Read Focus position :rF7100000 :rF7BEM₃M₂M₁M₀
- After the preset control of TYPE I, it is not possible to change the auto focus mode.
 If you want to change the focus position to auto , please add the following commands to the above commands.
 The additional commands is necessary for one position , not each position.
- Read focus Far limit :rF718MMMM
 Read focus Near limit :rF71AMMMMM
 Read fine adjustment data A :rF7BE0000
 Read fine adjustment data B :rF7C20000
 Read fine adjustment data C :rF7C40000
 Read fine adjustment data D :RF89500

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*30. PRESET MODE for TYPE I (Set the zoom and the focus position.)

Set the PRESET mode :WF75303
 Set far limit :wF718MMMM
 Set near limit :wF71AMMMMM
 Set Optical Zoom position :wF716NNNN
 Set digital zoom position :wFC6EXXXX
 Set focus position :wF712MMMM

Set the auto focus mode after the preset control of TYPE I.

Set the PRESET mode :WF75303
 Set the focus FAR limit :wF718PPPP
 Set the focus NEAR limit :wF71AQQQQ
 Set the fine adjustment data A:wF7BESSSS
 Set the fine adjustment data B:wF7C2TTTT
 Set the fine adjustment data C:wF7C4UUUU
 Set the fine adjustment data D:WF895VV
 Set Optical Zoom position :wF716NNNN
 Set digital zoom position :wFC6EXXXX
 Set focus position :wF712MMMM
 Select auto focus mode :WFF0E22

*31. Memorize Zoom data and Focus data for PRESET (Memorized by PC) ; TYPE II

Set manual focus :WFF0E2A
 Read Digital Zoom data :rFC6E0000 echo back data :rFC6EQ₃Q₂Q₁Q₀
 Read Optical Zoom position :rF7140000 :rF714S₃S₂S₁S₀
 Read Zoom trace curve :rF7BE0000 :rF7BET₃T₂T₁T₀
 Read Zoom trace curve number :RF89500 :RF895U₁U₀
 Read data A of Zoom trace curve :rF7C20000 :rF7C2V₃V₂V₁V₀
 Read data B of Zoom trace curve :rF7C40000 :rF7C4X₃X₂X₁X₀

*32. PRESET mode for TYPE II

Read Optical Zoom position :rF7140000 echo back data :rF714Y₃Y₂Y₁Y₀
 Stop the calculation of trace curve :WF894C0
 Write Zoom trace curve :wF7BET₃T₂T₁T₀
 Write Zoom trace curve number :WF895U₁U₀
 Write data A of Zoom trace curve :wF7C2V₃V₂V₁V₀
 Write data B of Zoom trace curve :wF7C4X₃X₂X₁X₀
 Start the calculation of trace curve :F89400

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If $Y_3Y_2Y_1Y_0 > S_3S_2S_1S_0$ then move to Tele

Set Tele position Limit :wF71ES₃S₂S₁S₀

Move to Tele :WFCBB99

or

If $Y_3Y_2Y_1Y_0 < S_3S_2S_1S_0$ then move to Wide

Set Wide position limit :wF71CS₃S₂S₁S₀

Move to Wide :WFCBB9B

Write digital Zoom position :WFC6EQ₃Q₂Q₁Q₀

after moving to Tele or Wide

Read zoom status :RF75100

If the 5th bit of echo back data is set "0", stop the moving.

:WFCBBFE

Sub m-com control :H0336

OSD control command

1.PC control mode ON.OFF :WEF42X₁X₀ (X₁X₀=01 ON X₁X₀=00 OFF)

2.Display the MENU screen :WEF9097

:WEF90FE

3.SET key command :WEF9098

:WEF90FE

4.UP key command :WEF9099

:WEF90FE

5.DOWN key command :WEF909B

:WEF90FE

6.Change Baudrate :WE27B0X₀ (X₀=0:4800 /even parity)

(X₀=4:1200 /even parity)

(X₀=8:2400 /even parity)

(X₀=C:9600 /even parity)

(X₀=2:4800 /none parity)

(X₀=6:1200 /none parity)

(X₀=A:2400 /none parity)

(X₀=E:9600 /none parity)

Sub m-com control :H0336

:WEF7E04

17. Open the OSD Menu Screen :WEE9097

18.Select the CAMERA ID :WEE909B]

by DOWN Key Command :WEE909B] 4 Times

:WEE909B]

:WEE909B

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19. Open the CAMERA ID Menu :WEE9097
20. Select Characters by :WEE9099 (UP Key Command)
 UP/DOWN Key Command :WEE909B (DOWN Key Command)
21. Enter the Character :WEE9098 (SET Key Command)
 by SET Key Command
 Up to eight characters can be selected.
22. Erase command, position select command, return command and end command can
 be selected by UP/DOWN/SET key command

MENU	
1. NEG/POS	:POS
2. AGC	:ON
3. WHITE BAL	:AUTO
4. SHUTTER	:P.AE
5. CAMERA ID	:ON
6. ZOOM	PUSH SET
7. ALC LEVEL	PUSH SET
8. FOCUS	:AUTO

:<>-. ,/:'?
0123456789
!ABCDEFGHIJ
KLMNOPQR
STUVWXYZ
ERASE POSITION RETURN
0.....

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