

SONY

COLOR CAMERA MODULE

CCB-EX37/EX37P

Command List

(Ver. 1.01) —English—

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The “Module Camera RS-232C Command List” and demonstration software for windows, 95 and 3.1 are available upon request.
The software is available for evaluation and/or demonstration, only.
Use of the software with customer developed application software may damage hardware, application program and the camera.
Sony Corporation is not liable for any damages under these condition.
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HARDWARE SPECIFICATION

Overview

This list describes RS-232C serial interface command and protocol information for control a module camera. Communication parameter is as follows;

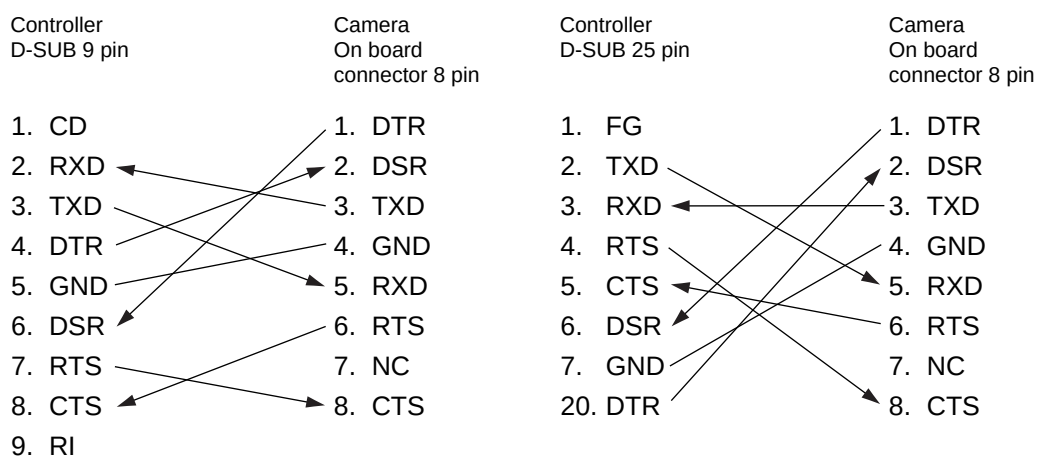
Mode : UART(Universal Asynchronous Receiver Transmitter)
ASCII, Full duplex
Character Length: 8 bits (LSB first)
Start bit : 1 bit
Stop bit : 1 bit
Baud rate : 19200 bps
Parity : Not include

Connector Pin Assignment

DTE Mode

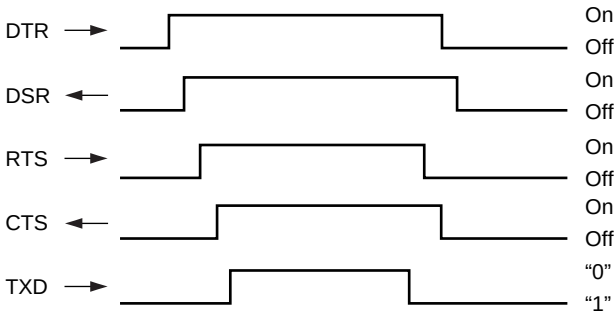
1. DTR Data Terminal Ready (Output)
2. DSR Data Set Ready (Input)
3. TXD Transmitted Data (Output)
4. GND Signal Ground
5. RXD Received Data (Input)
6. RTS Request to Send (Output)
7. NC No Connection
8. CTS Clear to Send (Input)

Cable Connection



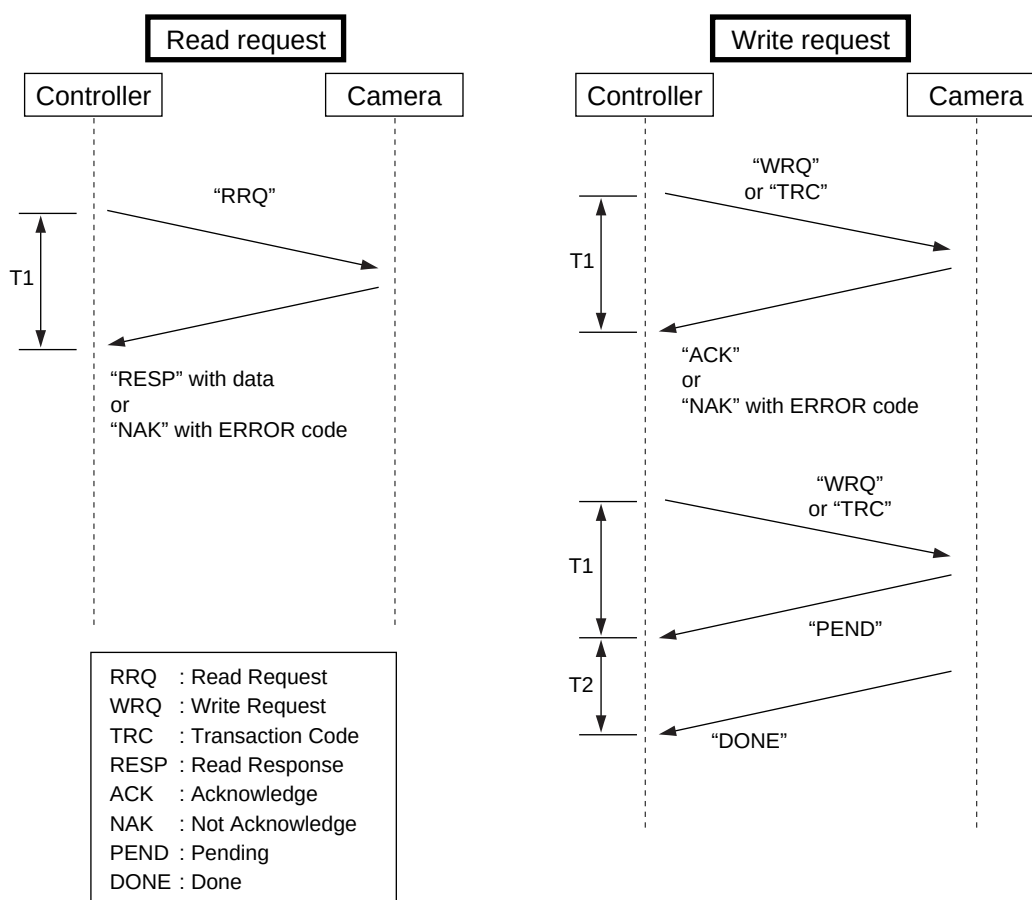
HARDWARE SPECIFICATION

Signal Exchange



PROTOCOL

Handshake Procedure



Time out

Controller have to wait minimum T1 or T2 interval. If camera does not respond in this interval, controller have to retry to send request.

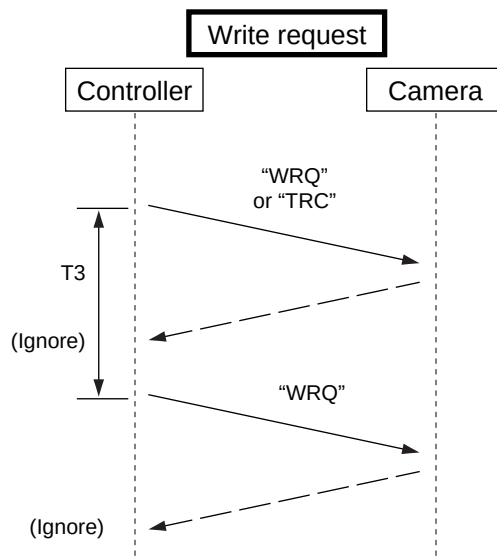
T1: 200 msec

T2: 10 sec

Pending

If camera is busy and can not accept next request immediately, camera can send "PEND" response to extend the time out. ("PEND" is a command acknowledge response)

PROTOCOL

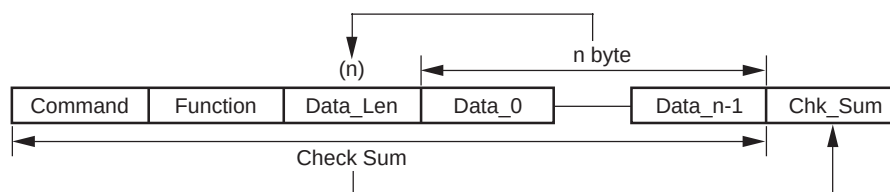
■ No Handshake Procedure (Write Request only)

● WRQ interval

If Controller would like to send WRQ more than once, controller have to wait minimum T3 interval. ($T3 > (T1+T2)$)

T3: 10.2 sec

PACKET STRUCTURE

Basic Packet Structure



Chk_Sum is byte EX_OR of Command, Function, Data_Len and Data.

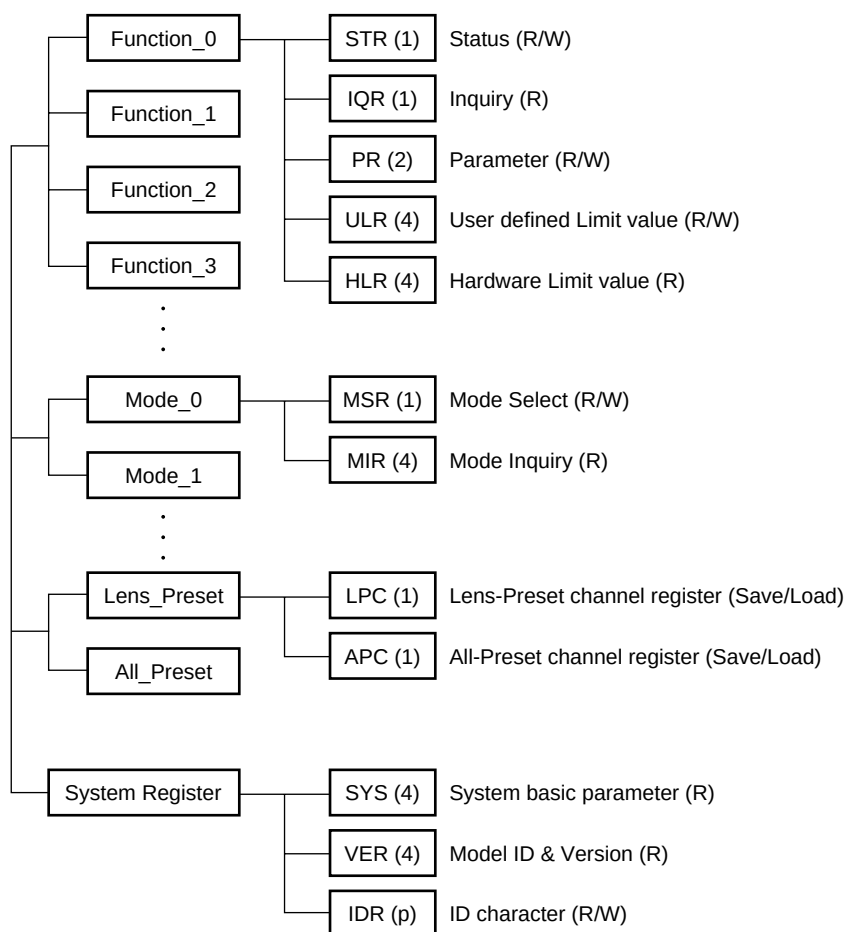
Example

	Command	Function	Data_Len	Chk_Sum
Sharpness RRQ_IQR :	83	06	00	85

	Command	Function	Data_Len	Para_Lo	Para_Hi	Chk_Sum
Zoom WRQ_PARA :	86	C0	02	AE	00	EA

REGISTER

Overview



STR (Status Register)

- 1 byte (R/W)

bit	R/W	Description
0	R	1: Parameter reached Hardware lower limit
1	R	1: Parameter reached Hardware upper limit
2	R	1: Parameter reached User defined lower limit
3	R	1: Parameter reached User defined upper limit
4		
5		
6	R/W	1: One shot trigger (self clear)
7	R/W	1: Auto 0: Manual

- NOTE :**
- If user asserts bit-6 and this feature has “One shot trigger” capability, camera issues the “one shot” command. Then after “One shot” process done, this bit will be self cleared.
 - When bit 7 is 1 (auto), WRQ_PARA (write request Parameter Register) command will be ignored.
 - When bit 7 is 1 (auto), “One shot” command will be ignored.

REGISTER

IQR (Inquiry Register)

- 1 byte (R)

bit	R/W	Description
0	R	1: Has Hardware limit value register
1	R	1: Has User defined limit value register
2	R	1: Has Parameter register
3	R	
4	R	
5	R	
6	R	1: Can accept one shot trigger
7	R	1: Has Auto control mode

PR (Parameter Register)

- 2 bytes (R/W)

Parameter_Lo	Parameter_Hi
--------------	--------------

NOTE : In the case of white balance function, Parameter Register low indicates white balance r-gain and Parameter Register high indicates white balance b-gain.

ULR (User defined limit value Register)

- 4 bytes (R/W)

Lower Limit Lo	Lower Limit Hi
Upper Limit Lo	Upper Limit Hi

NOTE : The user defined limit value is applicable for auto control mode only.
The user defined limit for the white balance function is applicable for low and high Parameter Register.

HLR (Hardware limit value Register)

- 4 bytes (R)

Lower Limit Lo	Lower Limit Hi
Upper Limit Lo	Upper Limit Hi

NOTE : The hardware limit for the white balance function is applicable for low and high Parameter Register.

REGISTER

MSR (Mode Select Register)

- 1 byte (R/W)

Mode Number

MIR (Mode Inquiry Register)

- 4 bytes (R)

Mode No. 7 – 0	Mode No. 15 – 8
Mode No. 23 – 16	Mode No. 31 – 24

0: Not Available, 1: Available

LPC (Lens-Preset channel register)

- 1 byte (Save/Load)

Channel

APC (All-Preset channel register)

- 1 byte (Save/Load)

Channel

Channel number zero (0) is a factory setting preset.
So channel zero is Load only.

SYS (System Basic parameter register)

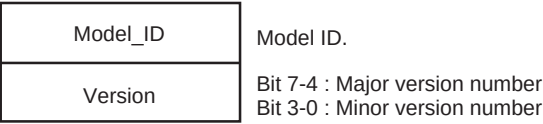
- 4 bytes (R)

ID_Data_Len	Maximum ID character Length
Lens_Preset_ch	Maximum Lens-Preset channel number
ALL_Preset_ch	Maximum All-Preset channel number
reserve	

REGISTER

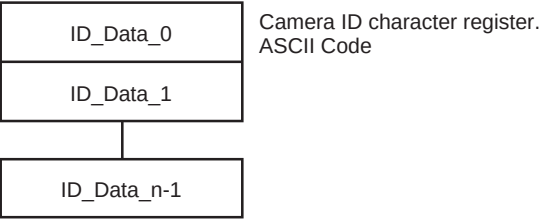
■ VER (Model ID and Version number)

- 2 bytes (R)



■ IDR (ID character register)

- n bytes (R/W)



COMMAND AND ERROR CODE

Command Code

Category	Command	Name	Description	Data length
Feature	81	RRQ_PARA	Read request function parameter	0
	82	RRQ_STR	Read request status register	0
	83	RRQ_IQR	Read request inquiry register	0
	84	RRQ_HLIMIT	Hardware limit value. Max/Min	0
	85	RRQ_ULIMIT	User defined limit value. Max/Min	0
	86	WRQ_PARA	Write request function parameter	2
	87	WRQ_STR	Write request status register	1
	88	WRQ_ULIMIT	User defined limit value. Max/Min	4
	89	TRC_INC_PARA	Increase function parameter	1
	8A	TRC_DEC_PARA	Decrease function parameter	1
Mode	90	RRQ_MIR	Read request mode inquiry register	0
	91	RRQ_MSR	Read request mode select register	0
	92	WRQ_MSR	Write request mode select register	1
Preset	A0	TRC_LDL_PRE	Load values for lens	1
	A1	TRC_LDA_PRE	Load all values	1
	A2	TRC_STL_PRE	Save current values for lens	1
	A3	TRC_STA_PRE	Save current all values	1
	A4	TRC_SZF_PRE	Set zoom and focus	4
System	B0	RRQ_SYS_BAS	System basic register	0
	B1	RRQ_VER	Model name and version	0
	B2	RRQ_ID	Camera ID character	0
	B3	reserve		0
	B4	WRQ_ID	Camera ID character	8
Response	F8	ACK	Acknowledge response	0
	F9	NAK	Not acknowledge response	1
	FA	RESP	Response for read request	X
	FB	PEND	Pending response	0
	FC	DONE	Done response	0

Error Code

Error code	Description	for
20H	Data received error	All
21H	Check sum error	All
22H	Unknown command	All
23H	Unknown function	All
24H	Invalid data	WRQ_xxx
25H	Over limit	WRQ_PARA, TRC_INC_PARA, TRC_DEC_PARA
26H	Data not exist	RRQ_xxx
27H - 4FH	Reserved	

COMMAND AND ERROR CODE

Packet Example

● Feature

RRQ_PARA	81	Function	00	Chk_Sum		
RRQ_STR	82	Function	00	Chk_Sum		
RRQ_IQR	83	Function	00	Chk_Sum		
RRQ_HLIMIT	84	Function	00	Chk_Sum		
RRQ_ULIMIT	85	Function	00	Chk_Sum		
WRQ_PARA	86	Function	02	Para_Lo	Para_Hi	Chk_Sum
WRQ_STR	87	Function	01	Data	Chk_Sum	
WRQ_ULIMIT	88	Function	04	LoLim_Lo	LoLim_Hi	
				UpLmt_Lo	UpLmt_Hi	Chk_Sum
TRC_INC_PARA	89	Function	01	Data	Chk_Sum	
TRC_DEC_PARA	8A	Function	01	Data	Chk_Sum	

● Mode

RRQ_MIR	90	Function	00	Chk_Sum		
RRQ_MSR	91	Function	00	Chk_Sum		
WRQ_MSR	92	Function	01	Data	Chk_Sum	

● Preset

TRC_LDL_PRE	A0	00	01	Channel	Chk_Sum	
TRC_LDA_PRE	A1	00	01	Channel	Chk_Sum	
TRC_STL_PRE	A2	00	01	Channel	Chk_Sum	
TRC_STA_PRE	A3	00	01	Channel	Chk_Sum	
TRC_SZF_PRE	A4	00	04	Zoom_Lo	Zoom_Hi	
				Focus_Lo	Focus_Hi	Chk_Sum

COMMAND AND ERROR CODE

● System

RRQ_SYS_IQR

B0	00	00	Chk_Sum
----	----	----	---------

RRQ_VER

B1	00	00	Chk_Sum
----	----	----	---------

RRQ_ID

B2	00	00	Chk_Sum
----	----	----	---------

WRQ_ID

B4	00	n	Data_0	Data_1	...	Data_n-1	Chk_Sum
----	----	---	--------	--------	-----	----------	---------

● Response

ACK

F8	00	00	Chk_Sum
----	----	----	---------

NAK

F9	00	01	Error Code	Chk_Sum
----	----	----	------------	---------

RESP

FA	00	n	Data_0	Data_1	Data_n-1	Chk_Sum
----	----	---	--------	--------	----------	---------

PEND

FB	00	00	Chk_Sum
----	----	----	---------

DONE

FC	00	00	Chk_Sum
----	----	----	---------

FUNCTION

Function	Code	Description	Limit control	LPC	APC
Brightness (Set up)	02	Brightness (Setup)	○		○
Exposure	04	Exposure	○		○
Sharpness	06	Sharpness	○		○
White Balance	08	White balance	○		○
Hue	0A	Hue	○		○
Saturation	0C	Saturation	○		○
Gain	0E	Gain	○		○
Gamma	10	Gamma	○		○
Shutter	12	Electric shutter	○		○
Zoom	C0	Lens zoom	○	○	○
Focus	C2	Lens focus	○	○	○
Iris	C4	Lens iris	○		○
V-phase	D1	Vertical sync. phase control	○		
H-phase	D2	Horizontal sync. phase control	○		
SC-phase	D3	Sub Carrier phase control	○		

MODE

Mode	Code	Description	LPC	APC
AE mode	05	Auto Exposure mode		○
AWB mode	09	Auto White balance mode		○
AF mode	C3	Auto Focus mode	○	○
Sync. mode	D0	Synchronization mode		
SF mode	E0	Special function mode		

● AE mode

Data	Description
00	BLC ON (All screen)
01	BLC ON Detection pattern 1
02	BLC ON Detection pattern 2
03	BLC ON Detection pattern 3
04	BLC ON Detection pattern 4
05	BLC ON Detection pattern 5
06	BLC ON Detection pattern 6
07	BLC ON Detection pattern 7
08	BLC OFF (All screen)

● AWB mode

Data	Description
00	ATW
01	ATW pro

● AF mode

Data	Description
00	
01	

MODE

● Sync. mode

Data	Description
00	Internal
01	Line Lock
02	VS
03	VBS
04	Reserve
05	HD/VD reset
06	VD-S
07	VD-W

● Special function mode

Data	Description
00	Normal
01	Color Bar
02	Negative picture
03 – FF	Reserve

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