SSC-CX34/34P/44
RS-232C Command List

Version 1.00

1. Hardware Specification

1.1 Overview

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

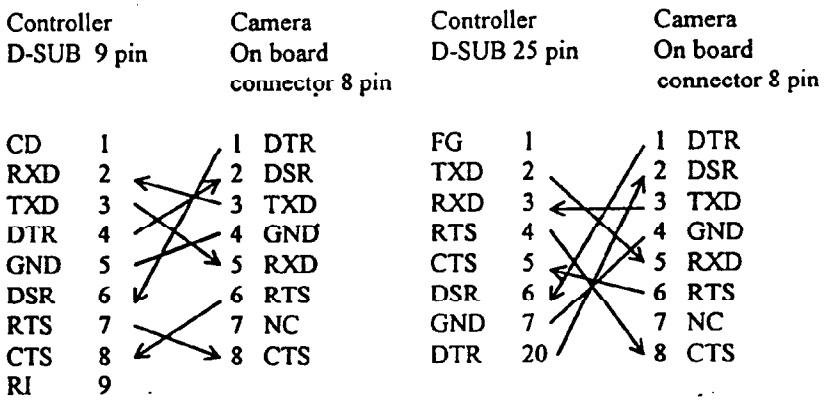
Mode:	UART(Universal Asynchronous Receiver Transmitter) ASCII, Full duplex
Character Length:	8 bits (LSB first)
Start bit:	1 bit
Stop bit:	1 bit
Baud rate:	19200 bps
Parity:	Not include

1.2 Connector Pin Assignment

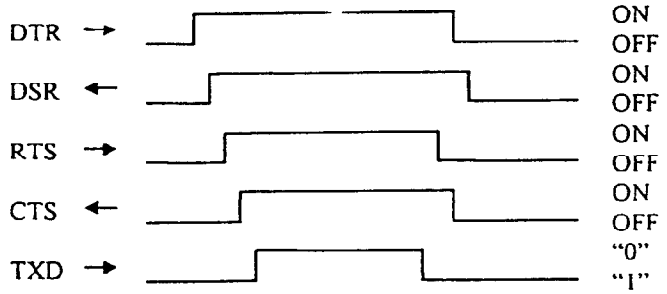
DTE Mode

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)

1.3 Cable Connection

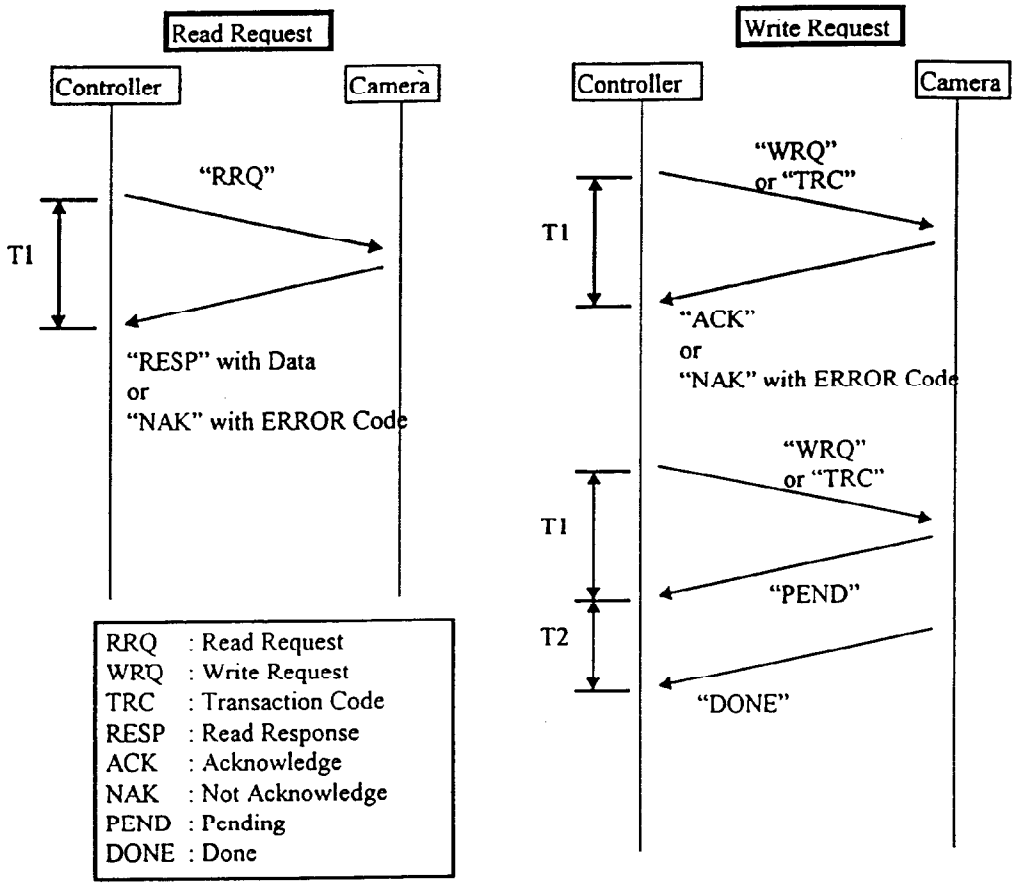


1.4 Signal Exchange



2. Protocol

2.1 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.

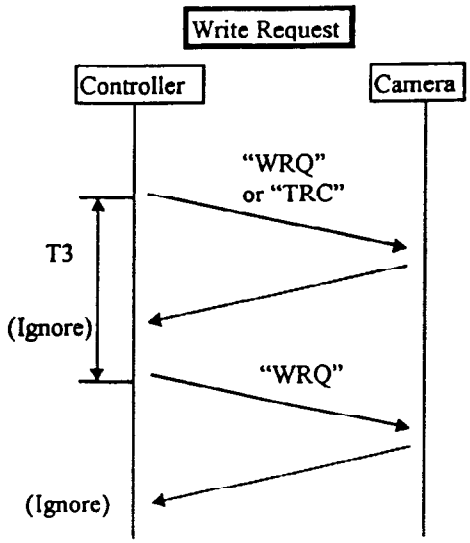
T1: 200msec
T2: 10sec

[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)

2.2 No Handshake Procedure

(Write Request only)



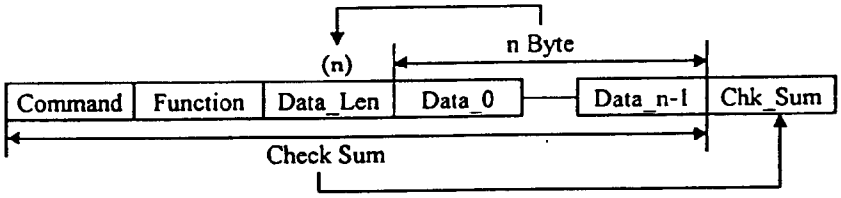
[WRQ interval]

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

T3: 10.2sec

3. Packet structure

3.1 Basic packet structure



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

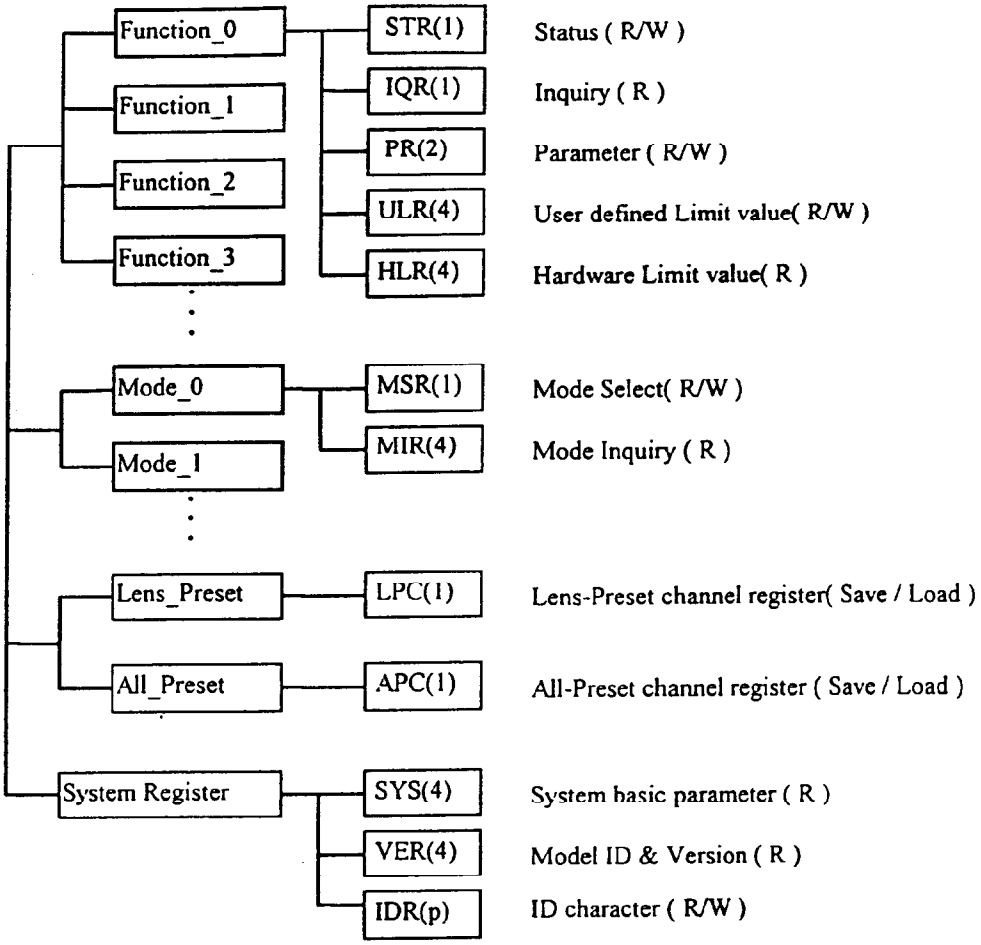
Example

	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

4. Register

4.1 Over view



4.2 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.

4.3 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

4.4 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.

4.5 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.

4.6 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.

4.7 MSR (Mode Select Register)

[1 byte] (R/W)

Mode Number

4.8 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

4.9 LPC (Lens-Preset channel register)

[1 byte] (Save / Load)

Channel

4.10 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.

4.11 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	

4.12 VER (Model ID and Version number)

[2 bytes] (R)

Model_ID	Model ID .
Version	Bit 7-4 : Major version number Bit 3-0 : Minor version number

4.13 IDR (ID character register)

[n bytes] (R/W)

ID_Data_0
ID_Data_1
ID_Data_n-1

Camera ID character register.
ASCII Code

5. Command and Error code

5.1 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

5.2 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	

5.3 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

<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

6. 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	✓		

7. 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	

Sync. Mode

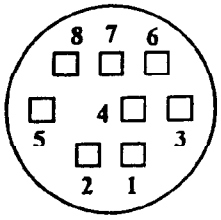
Data	Description
00	Internal
01	Line Lock
02	Reserve
03	Reserve
04	Reserve
05	Reserve
06	VD-S
07	Reserve

Special Function Mode

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

SSC-CX34/44/34P Lens Connector Information

1. Pin assign



Pin number	Name	Meaning	Voltage spec	Cable Color
1	Preset +	V1 = + Power for preset	12V p-p maximum	Red
2	Preset -	V2 = - Power for preset		White
3	Zoom Position Out	Zoom position voltage output	V2 to V1	Black
4	GND			Yellow
5	Focus Position Out	Focus position voltage output	V2 to V1	Blue
6	Focus In	Focus control voltage input	-12V to +12V	Green
7	Zoom In	Zoom control voltage input	-12V to +12V	Brown
8	Iris In	Iris control voltage input	-12V to +12V	Gray

* If Iris is auto mode, this voltage control is not accepted.

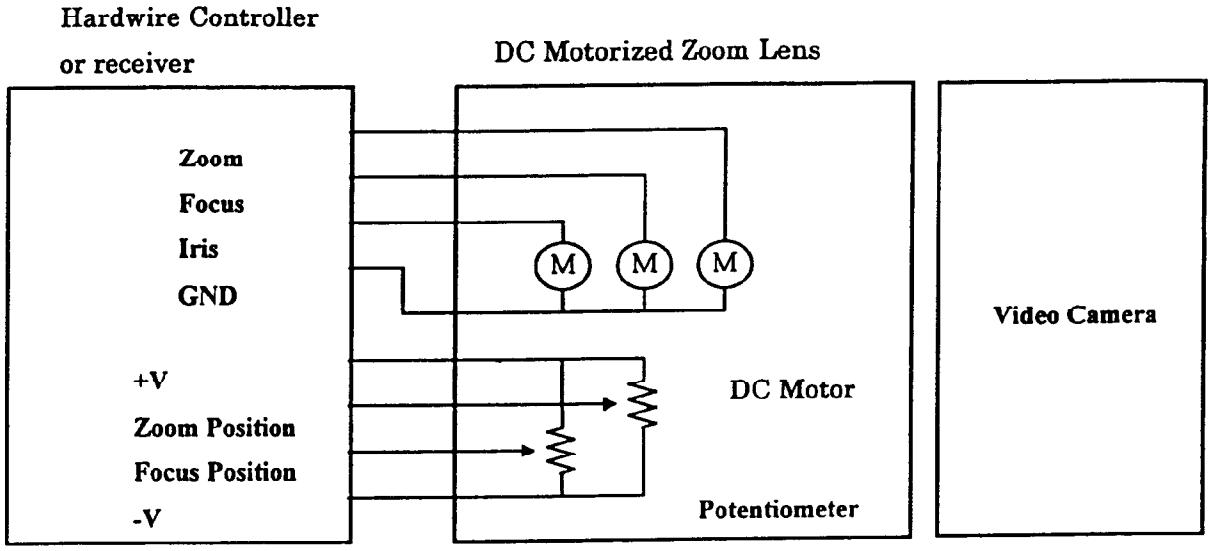
2. Lens Motion by NORM/REV switch

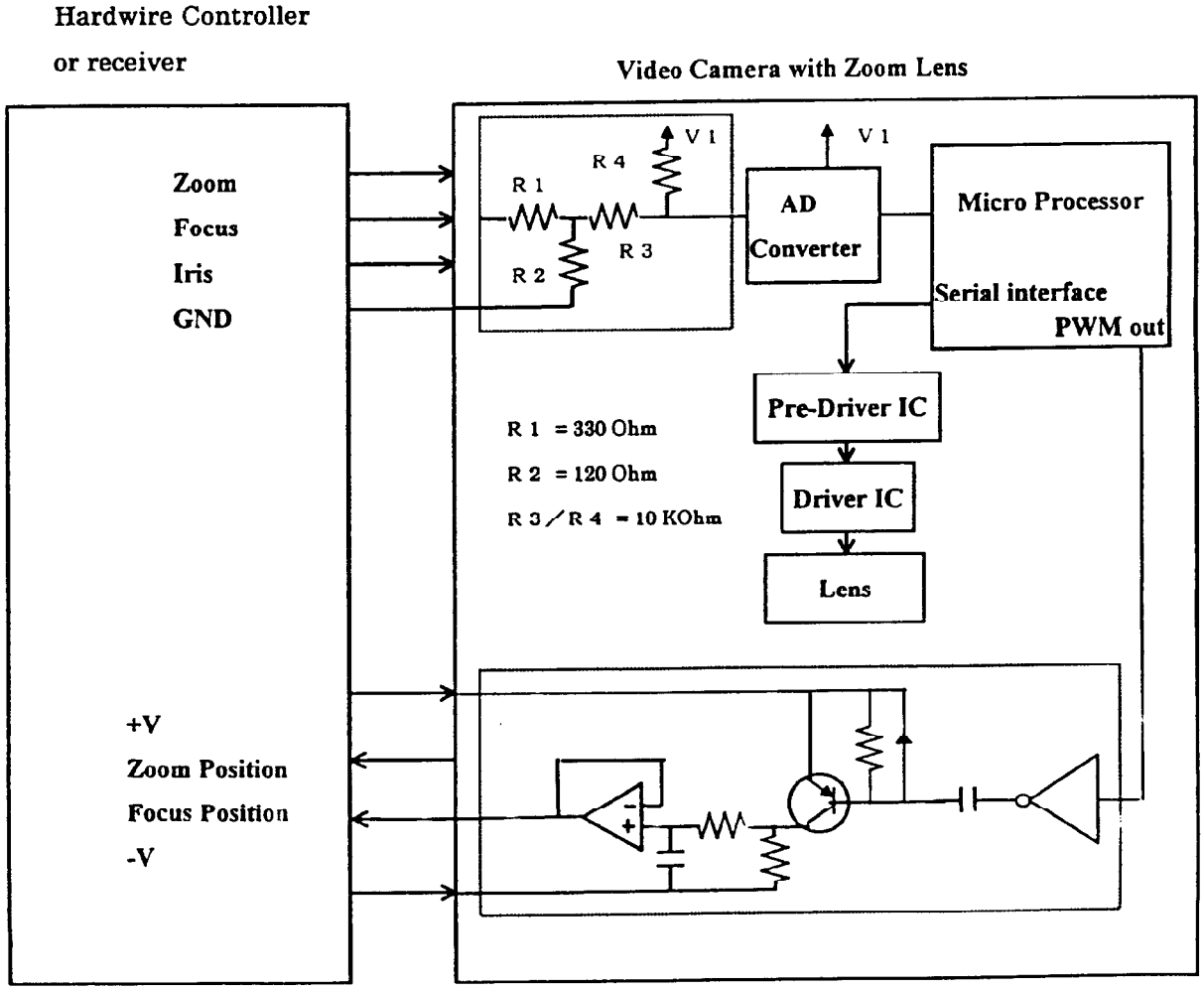
		Switch NORM position	Switch REV position
Zoom In	+ Voltage	Wide	Tele
7 pin	- Voltage	Tele	Wide
Focus In	+ Voltage	Far	Near
6 pin	- Voltage	Near	Far
Iris In	+ Voltage	Close	Open
8 pin	- Voltage	Open	Close

3. Position Output Motion

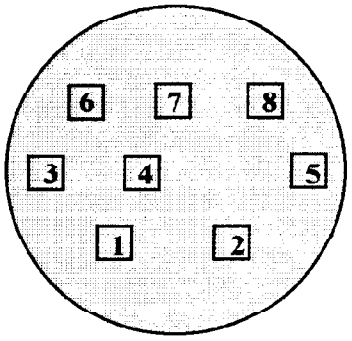
	Position voltage increase	Position voltage decrease
Zoom Position output 3 pin	Wide side (CX34/44) Tele side (CX34P)	Tele side (CX34/44) Wide side (CX34P)
Focus Position output 5 pin	Far side (CX34/44/34P)	Near side (CX34/44/34P)

SSC-CX34/34P DC Voltage Control



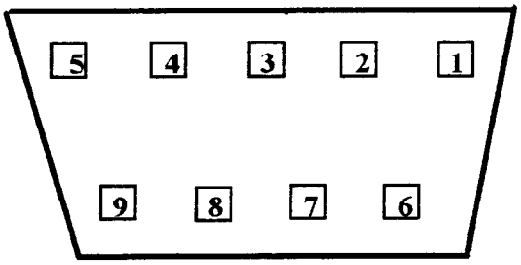


Sony Cable (1-690-391-21)
Pin Assignment



8 Pin Mini DIN (viewed from pin side of 1-690-391-21)

Note: Pin assignment on document handed out were based on facing the rear of the camera.



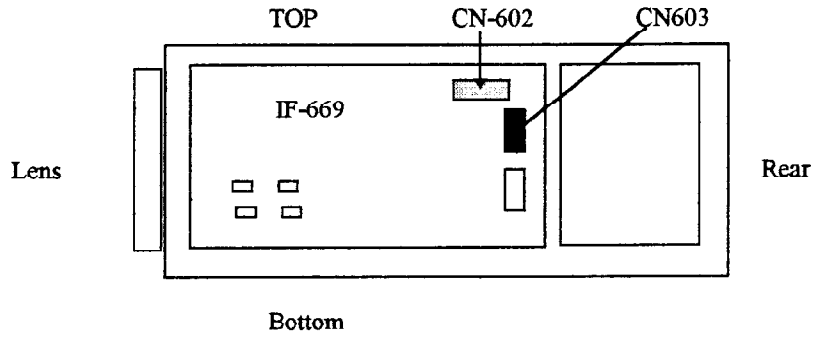
D-Sub 9 pin viewed from pin side of 1-690-391-21 (female)

8 Pin connector		D-sub 9 pin
1	⟷	1, 6 and 9
3	⟷	2
5	⟷	3
2	⟷	4
4 & 8	⟷	5
NC	⟷	7 & 8

SSC-CX34
Procedure for RS-232C control

Note: The Sony part number for the cable between the RS-232C ports of computer and the camera is 1-690-391-21. This is available from KCP. This cable has the Mini Din 8-pin (male) connector to connect to the camera, and the other end is the D-sub (female) 9-pin.

1. **Open the top cover of the SSC-CX34. Position the camera with the lens pointing left.**
2. **Locate connector CN603 on the IF669 board. This is the board that has the zoom and focus buttons on it.**



3. **Remove connector from CN603.**
4. **Attach this connector to CN602 as shown above.**
5. **Close the top cover of the SSC-CX34**
6. **The camera is now configured for RS-232C via the 8 pin Mini Din connector.**

Wiring between CX34 and PT-280-24P/PP (Pelco P/T)

		P2 (9PIN CON)	CX34 CON
Preset GND	(RED/WHT)	8	PIN 2 (WHT)
Preset +5V	(Black/WHT)	6	PIN 1 (RED)
Focus	(WHT/BRN)	3	PIN 6 (GRN)
ZOOM	(WHT/RED)	2	PIN 7 (BRN)
LENS COM	(WHT/ORG)	4	PIN 4 (YEL)
IRIS	(BLK)	1	PIN 8*(GRY)
ZOOM PRESET	(GRY/WHT)	7	PIN 3 (BLK)
FOCUS PRESET	(YEL/WHT)	9	PIN 5 (BLU)
GND	(GRN)	5	

*** THIS DOES NOT WORK IF UNIT IS SET TO AUTO IRIS MODE**