VISCA™/RS-232C CONTROL PROTOCOL

Scope

This control specification is applied to EVI series camera manufactured by Sony Corp.

NOTE : The interface board IF-51 is different in details.

The following specification covers overall control protocol for camera category. For detailed supported commands for each camera, refer to the command list of the each model.

Connection

Camera may be controlled by PCs (personal computers) or workstations by connecting as shown in **Fig. 1** or **Fig. 2**. **Fig. 1** shows one by one control using serial interface port of the PCs or workstations. By this connection, the address of the camera can be identified by the port number or the address assignable to the each camera.

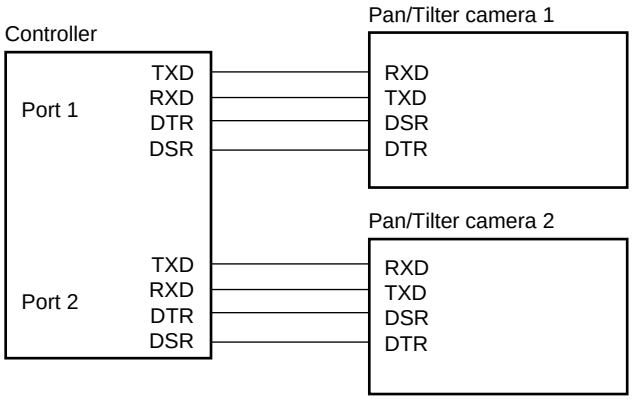

Fig. 1

Fig. 2 shows schematically connections of camera when daisy chained. For actual connection, refer to information supplied by each model. In this instance, the maximum sets on one network is seven and the address can be assigned automatically by the controller. The address of the controller is set to 0 and the camera address will be assigned from 1 to 7 (nearer, the younger address).

The interface to the controller is RS-232C, 9600 bps, 8 bits data, 1 start bit, 1 stop bit and non parity.

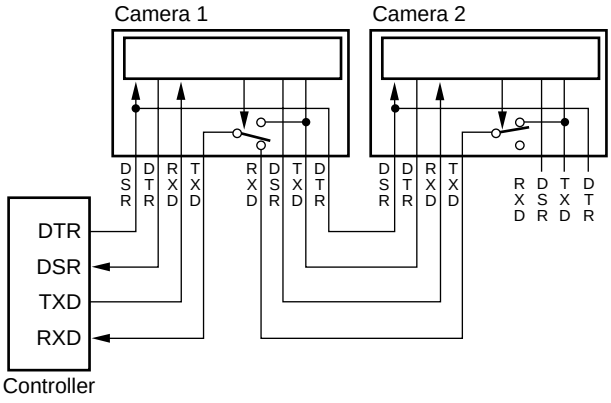

Fig. 2 Daisy chain connection

* "VISCA™" is a trademark of Sony Corporation.

Definition of Terms

- ACK message
  Signal from camera to the controller which returns acknowledge command execution, information for inquiry or error message etc..

- Address
  Address assigned automatically by address set command. Camera will be assigned from 1 to 7. The address of the controller is fixed to 0.

- Packet
  Fundamental Unit of the communication between controller and cameras. Comprised by Header (1 byte), Message (max. 14 bytes) and Terminator (1 byte; fixed FFH).

- Socket
  Command buffer memories prepared by camera to accept more than one commands. The number of the sockets are two.

Communication Specifications

◇ Communication specification (RS-232C)

- Communication speed: 9600 bps
- Start bit : 1
- Stop bit : 1
- Data bits : 8
- Parity : None
- MSB first

◇ Communication protocol

● Communication from the controller

Communication is started by header which comprises sender's address and receiver's address followed by message and ended by terminator. The message part comprises communication mode (2 bytes), category code (2 bytes) and parameters. The maximum length of the message is 14 bytes. The terminator is fixed to FFH and the controller should check the value to terminate communication. The bit 15 should be 0 in the message part.

Header	Com-mode	Category code	Message	Terminator
8x	01	rr	.. ..	FF

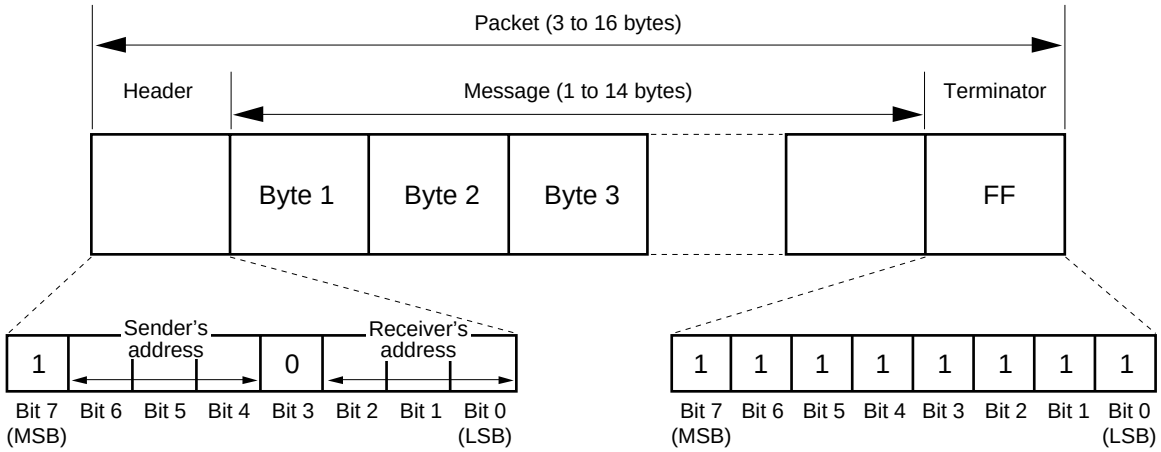

Fig. 3

Header	: Signifies the start of the communication and comprises the sender's address and receiver's address. Since the address of the controller is fixed to 0, header is 8x in which x is the receiver's address. (The value of x should be from 1 to 7) In case of broad cast, the header should be 88H.
Com-mode	: Code which specifies the category of command.
Control command	: 01H
Information request command	: 09H
Net-keeping command	: 00H
Category	: Code which roughly specifies the category the command is applicable.
Main message	: Part between header and terminator. 14 bytes maximum. Comprises command and parameter if any.
Terminator	: Code which signifies the end of communication. Fixed to FFH.

● Commands

A command which is sent from the controller to the camera is comprised in the message part of the send data. The commands are roughly classified into several functions such as to control camera, to inquire the information of the camera and the ones for various purposes. The controller commands may comprise some parameters as needed.

● ACK message

The ACK message is returned to the controller from the camera to acknowledge the command. ACK message comprises the address of the camera (expressed by z and z = address + 8), socket number (y) and terminator. Socket is the memory buffer reserved in the camera and used to store commands. Having this feature enables the camera to execute new commands during former commands being under execution.

In case of inquiry commands, the information is returned between the third byte and the terminator.

If the commands are inquiry, the camera returns information message immediately, but for the commands, the camera returns ACK message immediately and returns the command completion message when the command is actually executed.

ACK	z0 4y FF
Command completion	z0 5y FF
Information return	z0 50 .... FF

Following message is sent from the camera to the host when power ON.

Address set	z0 38 FF

● Error messages

If the command is not executable or failed to execute, the camera returns error message instead of the acknowledge message. The error message is expressed by the following codes.

syntax error	z0 60 02 FF
command buffer full	z0 60 03 FF
command cancel	z0 60 04 FF
No sockets	z0 60 05 FF
Command not executable	z0 60 41 FF

● Broadcast

Used to command all the set regardless the individual address.

In this mode of transmission, the header code is set to 88H.

● Auto address assignment

This command is only valid when the camera is connected as shown in **Fig. 2**. When the camera receives the address assignment command (88 30 01 FF), the first camera sets parameter 01 as the self address and hands over to the next camera by incrementing this parameter.

The controller can recognize how many camera cameras are connected on the network by the returned parameter.

◇ Flow of information transmission

The flow of information transmission between the controller and the camera should be one of the following examples.

● Inquiry is executed immediately

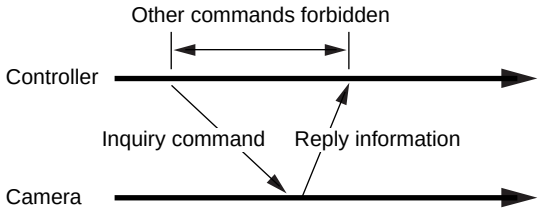

Fig. 4

● Command is stored in a socket and executed later

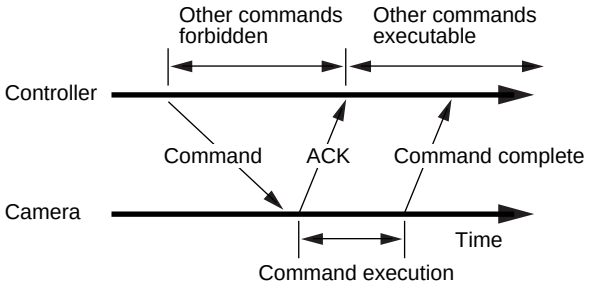

Fig. 5

● Return of error message (1)

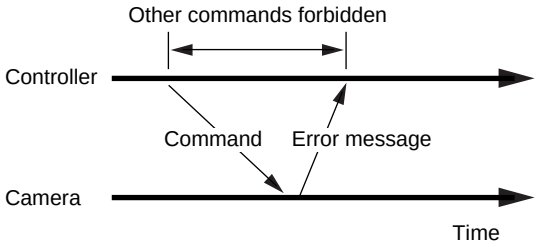

Fig. 6

● Return of error message (2)

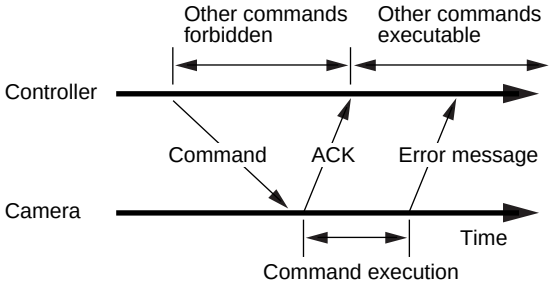

Fig. 7

● Execution of more than one commands

Fig. 8 shows the case when two commands are executed.

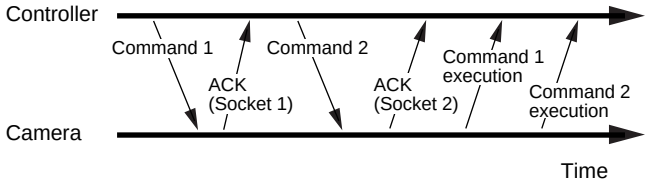

Fig. 8

● Cancel of commands (1)

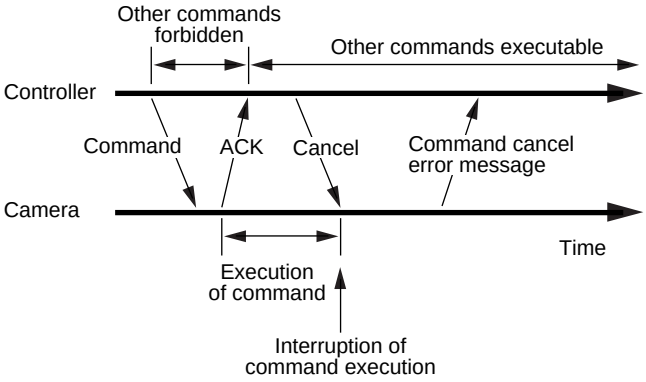

Fig. 9

● Cancel of commands (2)

Cancel is sent before command completion message is received, but the command is already executed. In this case, no socket error message is returned since the socket of the camera is cleared.

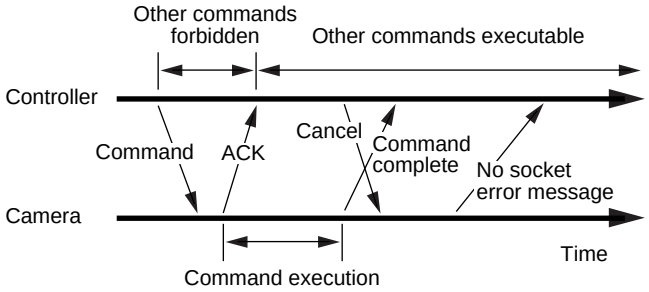

Fig. 10

● Continuous information transmission, Cancel of continuous information transmission.

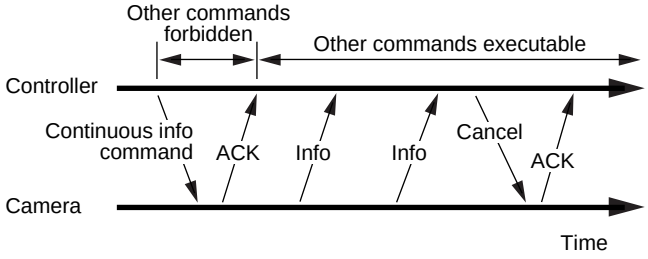

Fig. 11