

TANDBERG Telecom AS		17.06.03	Page 1 of 4
Interfacing to the TANDBERG WAVE II Camera		Rev. 5	D13186
	Date	Sign.	Reason for change
Prep.	13.06.03	MLU	01 – Initial revision
Tech.			02 – Changed syntax and explanations
App.			03 – Added further commands
			04 – Further position specs and spelling
			05 – Added inquiry commands

D13186

Interfacing to the TANDBERG WAVE II Camera

Introduction

The TANDBERG WAVE II camera uses a RS-232 control interface that resembles the Sony VISCA protocol.

RS232 Parameters

The communication parameters for the RS232 interface must be set to:

- 9600 bits per second
- 8 databits
- No parity
- 1 stopbit
- No hardware flow control
- No software flow control

These parameters are fixed, and are not user configurable. All databytes are pure binary information, i.e. the data is not ASCII-encoded.

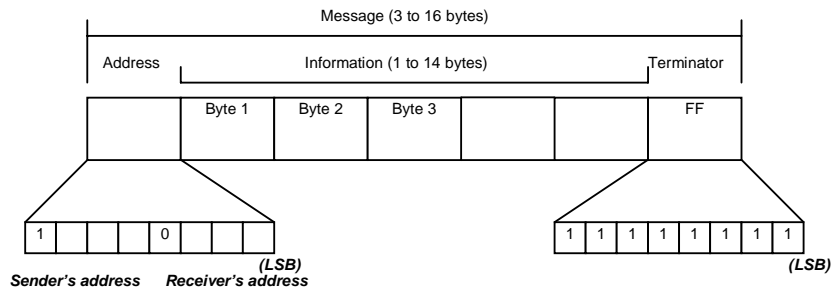
Message Format

Commands are initiated from the host (i.e. the codec or any other external controller) to the camera. After a camera has been issued a command, the camera will generate a response. Commands and responses (messages) have the following format:

Address byte (1) - Information bytes (1..14) - Terminating byte (1)

The minimum length of any command or response is 3 bytes.

1. **Address byte:** Let us assume there is one host, i.e. the Codec (the host is the unit controlling the camera). The host has address 0. The four least significant bits of the address byte contain the address of the receiver. In the case of a broadcast message, the receiver address should be set to 8. When we are operating a single camera, the address is 1. Hence, address bytes in messages from the host are 0x81, and messages from the camera to the host are 0x90 (the protocol allows for up to 7 cameras).
2. **Message bytes:** Any number of bytes containing the actual message information. Bytes may have any value in the range 0...254. The value 255 (i.e. hexadecimal FF) is reserved for the terminating byte.
3. **Terminating byte:** All messages must be terminated with a byte containing all 1's, i.e. decimal 255 (or hexadecimal FF).



Command and Response Exchange Sequence

When the camera receives a command, it responds with either an ACKNOWLEDGE response, a COMPLETION response or an ERROR response:

- ACK message: 90-4Y-FF
Returned by camera when it receives the command. No ACK is returned for inquiries.
- Completion message: 90-5Y-FF (commands) & 90-5Y-...-FF (inquiries)
Returned by the camera when execution of commands and inquiries are completed.
- Error packets: 90-6Y-...-FF
When command or inquiry failed to be executed.
- Y = socket number
Camera contains two buffers so that two commands, including the commands being executed, can be received.

There are of course exceptions to these rules:

- An Initialize message will respond as indicated in the table below (this message is in fact a broadcast message, and any unit other than the host receiving a broadcast message must pass it on).

Table of Commands

Command	Message	Comment
Autofocus on	81 01 04 38 02 FF	
Manual focus on	81 01 04 38 03 FF	
Focus in start	81 01 04 08 02 FF	
Focus out start	81 01 04 08 03 FF	
Focus stop	81 01 04 08 00 FF	
Focus direct	81 01 04 48 0p 0q 0r 0s FF	pqrs: focus position, far 4096 –near 40960
Focus inquiry	81 09 04 48 FF	Response: 90 50 0p 0q 0r 0s FF pqrs: focus position
Zoom in start	81 01 04 07 3p FF	p: speed parameter, low 0 - high 7
Zoom out start	81 01 04 07 2p FF	p: speed parameter, low 0 - high 7
Zoom stop	81 01 04 07 00 FF	
Zoom direct	81 01 04 47 00 0q 0r 0s FF	qrs: zoom position, 0 – max 1023
Dzoom off	81 01 04 06 03 FF	
Zoom inquiry	81 09 04 47 FF	Response: 90 50 00 0q 0r 0s FF qrs: zoom position
Tilt up start	81 01 06 01 0p 0t 03 01 FF	p: pan speed, t: tilt speed, low 0 – high 7
Tilt down start	81 01 06 01 0p 0t 03 02 FF	
Pan left start	81 01 06 01 0p 0t 01 03 FF	
Pan right start	81 01 06 01 0p 0t 02 03 FF	
Pan/tilt stop	81 01 06 01 03 03 03 03 FF	
Pan/tilt direct	81 01 06 02 0p 0t 00 0x 0y 0z 00 00 0u 0v FF	p: pan speed, t: tilt speed xyz: pan position, left 1295 - centre 647 - right 0 uv: tilt position, up 248 - centre 172 - down 0
Pan/tilt home	81 01 06 04 FF	

TANDBERG Telecom AS	17.06.03	Page 4 of 4
Interfacing to the TANDBERG WAVE II Camera	Rev. 5	D13186

Pan/tilt inquiry	81 09 06 12 FF	Response: 90 50 00 0x 0y 0z 00 00 0u 0v FF xyz: pan position uv: tilt position
Preset store	81 01 04 3F 01 0p FF	P: preset number, 1-15
Preset activate	81 01 04 3F 02 0p FF	p: preset number, 1-15
Preset inquiry	81 09 10 0p FF	Response: 90 50 00 0x 0y 0z 00 00 0u 0v 00 0q 0r 0s FF, p: preset number, xyz: pan position, uv: tilt position, qrs: zoom position
AE auto	81 01 04 39 00 FF	AE: Automatic Exposure
AE manual	81 01 04 39 03 FF	
Bright exp on	81 01 04 3E 02 FF	
Bright exp off	81 01 04 3E 03 FF	
Bright exp inc	81 01 04 0E 02 FF	
Bright exp dec	81 01 04 0E 03 FF	
Bright exp reset	81 01 04 0E 00 FF	
WB auto	81 01 04 35 00 FF	WB: White Balance
WB manual	81 01 04 35 05 FF	
WB one push	81 01 04 10 05 FF	
Backlight on	81 01 04 33 02 FF	
Backlight off	81 01 04 33 03 FF	
Shutter Reset	81 01 04 0A 00 FF	
Shutter Up	81 01 04 0A 02 FF	
Shutter Down	81 01 04 0A 03 FF	
Gain Reset	81 01 04 0B 00 FF	
Gain Up	81 01 04 0B 02 FF	
Gain Down	81 01 04 0B 03 FF	
Bright Reset	81 01 04 0D 00 FF	
Bright Up	81 01 04 0D 02 FF	
Bright Down	81 01 04 0D 03 FF	
IR on	81 01 06 08 02 FF	
IR off	81 01 06 08 03 FF	
LED on	81 01 33 01 01 FF	
LED off	81 01 33 01 00 FF	
ID Inquiry	81 09 04 22 FF	Response: 90 50 zz xx 00 yy FF zz xx=camera rev, yy=firmware rev
Network initialize	88 30 01 FF	Response: 88 30 xx FF xx=(1+number) of cameras in chain
IF clear	88 01 00 01 FF	Clears buffer & cancels current command