Technical Manual (Ver 1.04)

SANYO

Color Camera Module

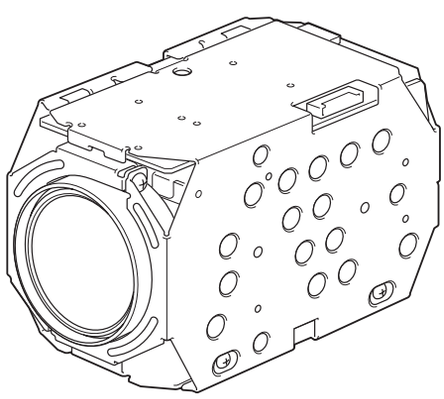
Model No.

- **NTSC Model**

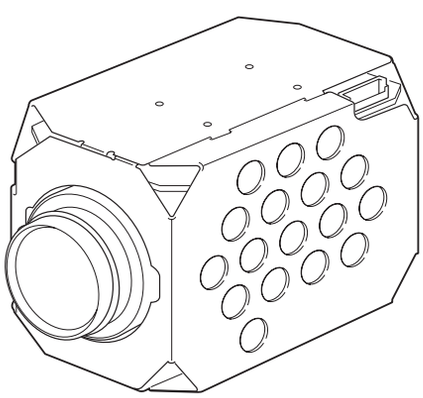
VCC-MD800 (×36, Day/Night type)
VCC-MD700 (×36, Color type)
VCC-MD600 (×30, Day/Night type)
VCC-MD500 (×30, Color type)
VCC-MD400 (×22, Day/Night type)
VCC-MD300 (×22, Color type)

- **PAL Model**

VCC-MD800P (×36, Day/Night type)
VCC-MD700P (×36, Color type)
VCC-MD600P (×30, Day/Night type)
VCC-MD500P (×30, Color type)
VCC-MD400P (×22, Day/Night type)
VCC-MD300P (×22, Color type)



VCC-MD500/MD500P
VCC-MD600/MD600P
VCC-MD700/MD700P
VCC-MD800/MD800P



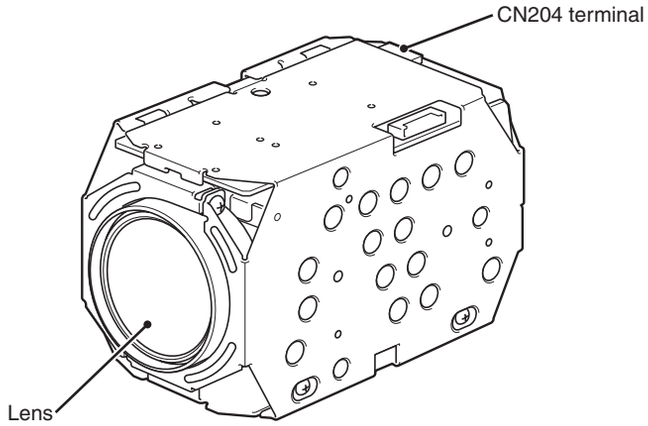
VCC-MD400/MD400P
VCC-MD300/MD300P

Please note that specifications and unit exterior design are subject to change without notifications.

Contents

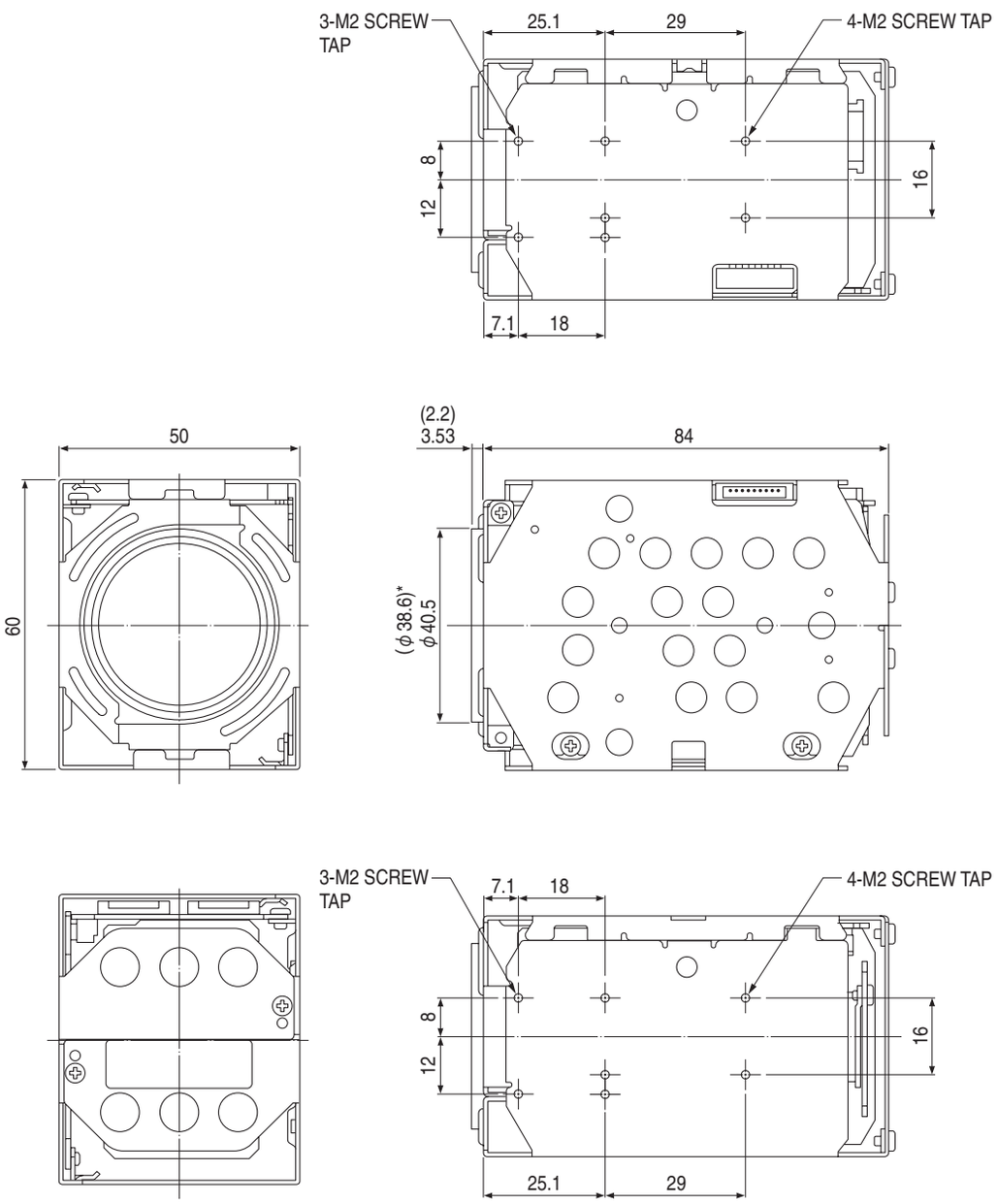
Parts Names and Dimensions

■ VCC-MD800/700/600/500 Series



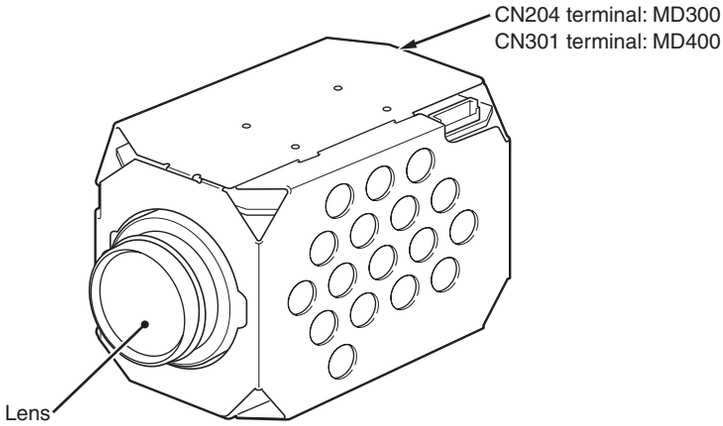
■ Dimensions

Note: The numbers within the brackets refer to the dimensions of the VCC-MD700 and MD800 models.



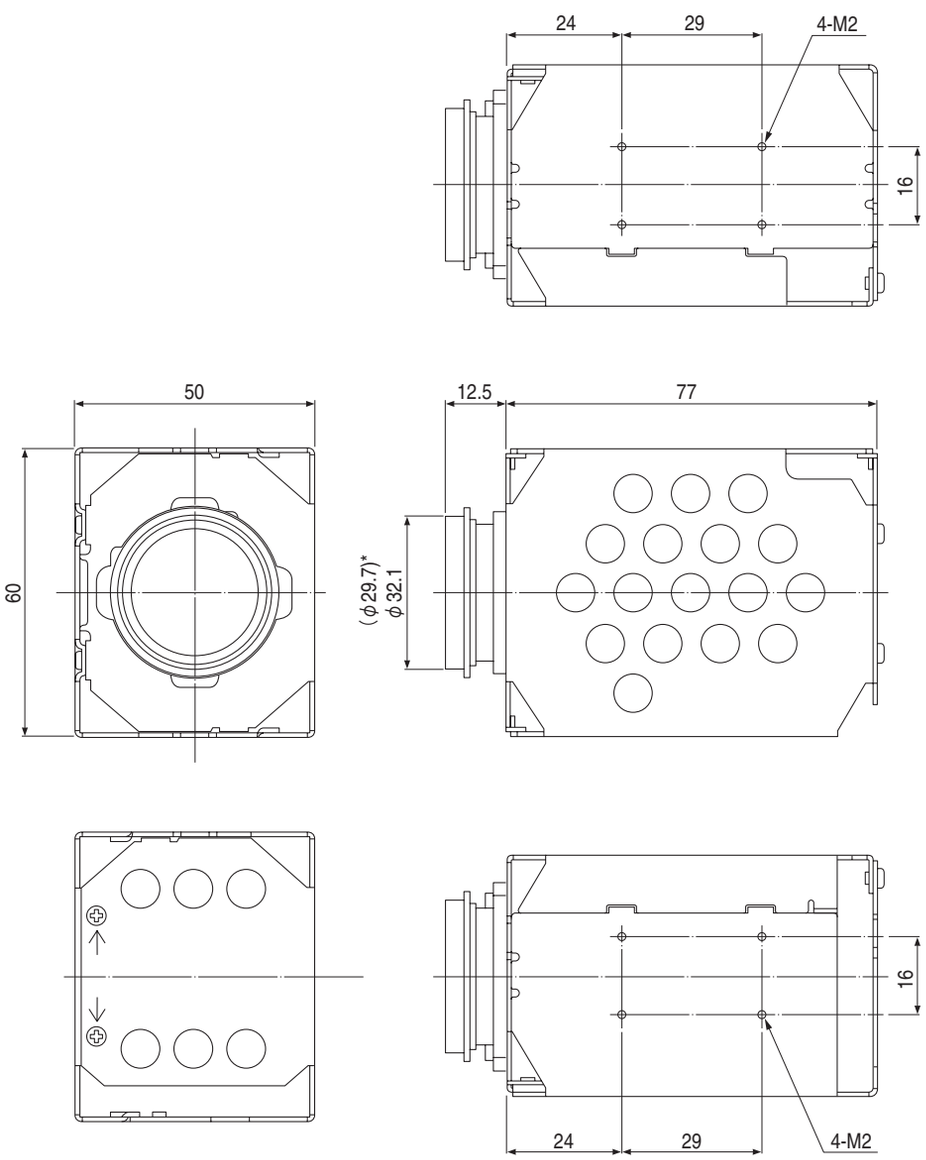
Parts Names and Dimensions

■ VCC-MD400/MD300 Series



■ Dimensions

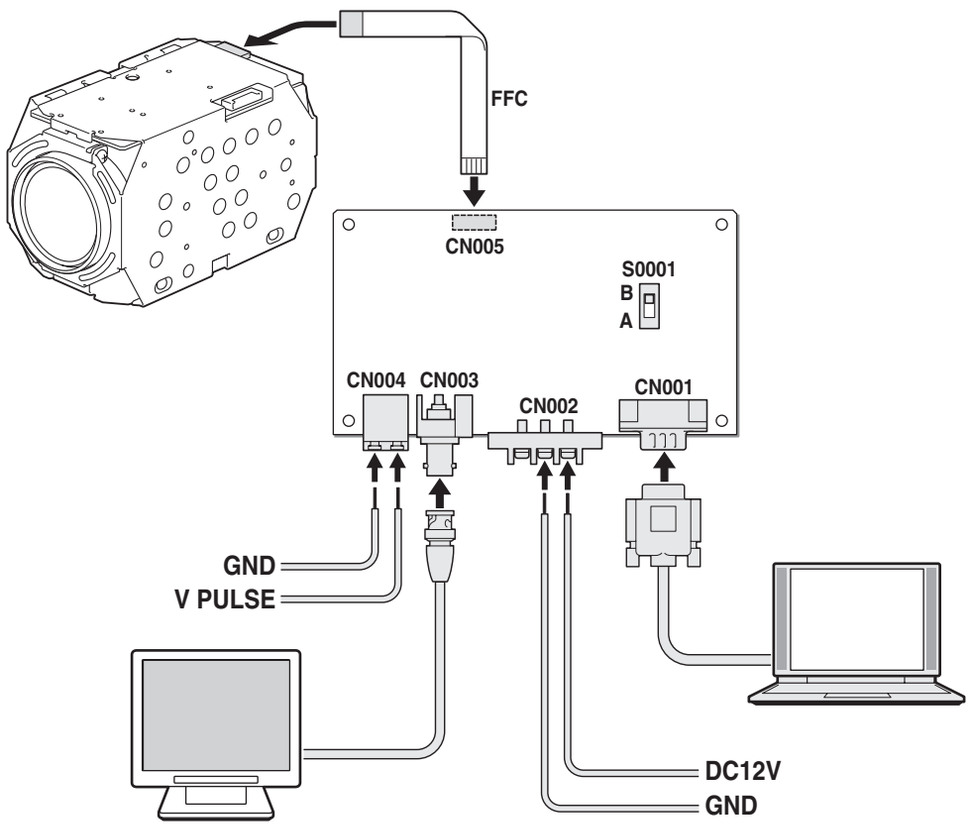
Note: The numbers within the brackets refer to the dimensions of the VCC-MD400 model.



Connection

[1] Connection of the Interface Board and Camera Unit

Connect the camera unit and the interface board using the FFC (flexible flat cable). Connect the various terminals of the interface board using the necessary cables.



[2] Interface Board Specifications

Connector	Terminal Name	Details
CN001	RS232C	PC
CN002	Screw	Power Source (DC12V±1V)
CN003	BNC	VIDEO OUTPUT
CN004	Push Lock	V PULSE (External Tuning)
CN005	FC Connector	Camera Unit Connection
S0001	Slide Switch	RS-232C Cable Type Selection A Side: Straight Cable B Side: Cross (Interlink) Cable

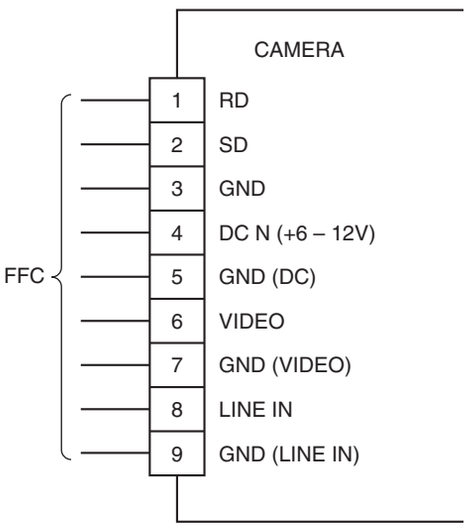
■ V PULSE

Input the signal of the following external tuning into the V PULSE terminal (CN004).
Input a signal that satisfies the requirements in **[3] External Synchronous Signals 1 External Synchronization Specifications** on the following page.

Input-Output Terminal Descriptions

[1] Input-Output Terminal Layout and Specifications

Power Supply: DC 6-12V



Pin Number	Signal Name	Function I/O	Signal Specifications
1	RD: RS-232C	Communication Line (Receiving)	Low: Max 0.8V High: Min 2.0V
2	SD: RS-232C	Communication Line (Transmitting)	Low: Max 0.1V High: Min 4.4V
3	RD&SD GND	Communication GND	—
4	DC IN	DC Power Supply Input	DC +6 – 12V
5	DC IN GND	Power Supply GND	—
6	VIDEO OUT	75Ω C Cut Output	1.0V±0.2Vp-p
7	VIDEO OUT GND	Imaging GND	—
8	LINE IN	External Tuning Input	60 (50: PAL) Hz ±0.25 Negative Synchronization
9	LINE IN GND	External Synchronization GND	—

[2] FFC Compliance

- **FCI SFW9R-1STE1LF (Lead Free Product)**

Core Number	9 pin
Pitch Between Conductors	1.00±0.05 mm
Length of Recommended Insulation	Under 108.0±0.10 mm
Thickness of Terminal	0.30±0.05 mm

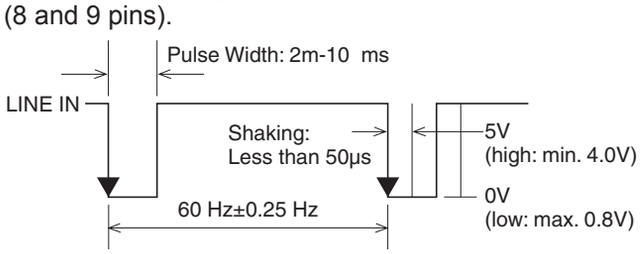
[3] External Synchronous Signals

This camera module uses external synchronization to synchronize with the camera.

1 External Synchronization Specifications

- **NTSC Format: 60 Hz±0.25 (Negative Synchronization)**
- **PAL Format: 50 Hz±0.25 (Negative Synchronization)**

Input the LINE IN signal into the external synchronization signal input terminal of the camera (8 and 9 pins).



Note: Do not input signals other than LINE IN. Image synchronization failure may occur (shaking, jittering, etc.).

2 Internal/External Synchronization

When the power to the camera is turned on, the external signal is input into the external synchronization signal input terminal (8 and 9 pins). The camera is driven by external synchronization in the case of external synchronization (L-L). Even if external synchronization is input, this does not switch in the case of internal synchronization (INT). When there is no input signal, the 8 pin is set to Open and High:5V and is automatically set to internal synchronization camera drive.

Note: When the camera is configured to external synchronization (L-L), do not use the 8 pin to fix the LowGND. This shifts the internal synchronization frequency of the camera and normal imaging signals cannot be emitted. Although synchronous switching is automatic even when switching the signal input after turning the power on, image shaking, etc. may occur.

[4] External Camera Control

This camera module can control the various functions from the RS232C port of a PC, etc.

- **RS232C Communications Circuit**

The communication interface of the camera (1, 2, and 3 pins) is on the C-MOS level. A level shift circuit (5Vp-p ↔ 12Vp-p) is separately required to directly input to a PC, etc.

Communications Protocol

[1] Communications Format

The communication unit is a 4 (min)-24 (max) byte packet.

・Communications Speed:
2400, 4800, 9600, 19200, 38400
9600 bps
(DEFAULT MD800 – 500)

*MD400 and MD300 cannot connect at 38400bps.
DEFAULT is 19200bps.

・Data Length: 8 bit
・Start Bit: 1 bit
・Stop Bit: 1 bit
・Parity:None
・Flow Control: None

● Packet Format

Header	Message 0	Message 1	Message 2	…	Checksum	Terminator (0xFF)

● Header Format

1	0/1	0/1	0	0	0	0	0
Bit 7 (MSB)	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0 (LSB)

・Bit 0-2: Fixed [0] *Reserved bit: Camera address (0-7)
・Bit 3: Fixed [0] *Reserved bit: During broadcast transmissions
・Bit 4: Fixed [0]
・Bit 5: During query commands [0], during settings command [1]
・Bit 6: During settings/query [0], during response to query [1]

● Terminator Format

1	1	1	1	1	1	1	1
Bit 7 (MSB)	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0 (LSB)

・Bit 0-7: Fixed [1]

● Message Format

0	0/1	0/1	0/1	0/1	0/1	0/1	0/1
Bit 7 (MSB)	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0 (LSB)

・Bit 0-6:Refer to the various commands (0-127)
・Bit 7: Fixed [0]

● Checksum Format

0	0/1	0/1	0/1	0/1	0/1	0/1	0/1
Bit 7 (MSB)	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0 (LSB)

・Bit 0-6: Take the value that sets the lower 7 bits of the values added from the header to the checksum to 0.
・Bit 7: Fixed [0]

● Response Command Format

1	1	1	1	0/1	0/1	0/1	0/1
Bit 7 (MSB)	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0 (LSB)

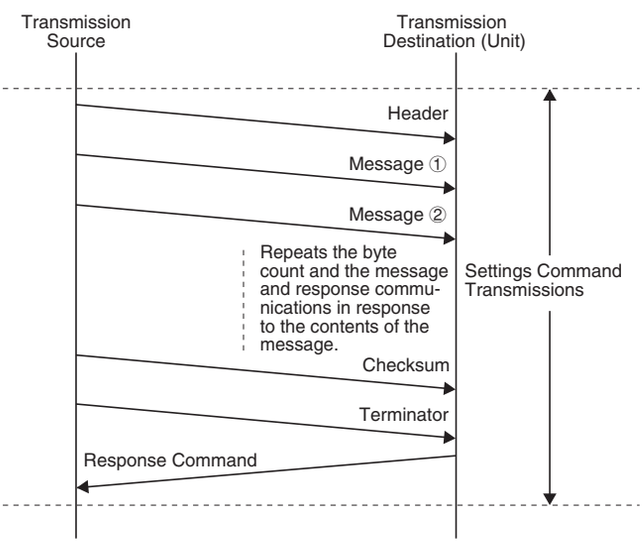
・Bit 0-3: ACK(Ah) / NACK(Bh) / ERR(Ch)
・Bit 4-7: Fixed [1]

・ACK: This is the response when the process of the received command is correctly completed after receiving the data in the correct format.
・NACK: This is the response when data is received in an incorrect format.
・ERR: Although the data is received in the correct format, this is the response when the process regarding the received command is incorrect or cannot be conducted.

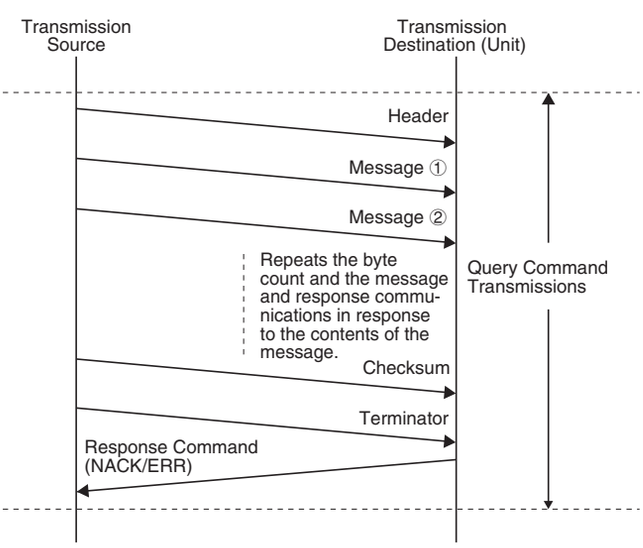
[2] Communications Flow

Note:
- Start the transmission of the next data after confirming the response command.
- The maximum transmission interval of the various byte data is 500 [msec]. If this is exceeded, a communication error is detected in the camera unit, the receiving data is deleted, and data from the header is waiting to be received again. Furthermore, there are no special regulations regarding the minimum value.
- All the commands can be acquired after the periods below after start-up.
  MD600(P), MD500(P): 6 seconds
  MD800(P), MD700(P): 9 seconds
  When auto pixel defect compensation is set to ON, below period will be added to above at the longest.
  MD600(P), MD500(P): 15seconds
  MD800(P), MD700(P): 20seconds
  In factory default, Auto pixel defect compensation is set to OFF at start-up.

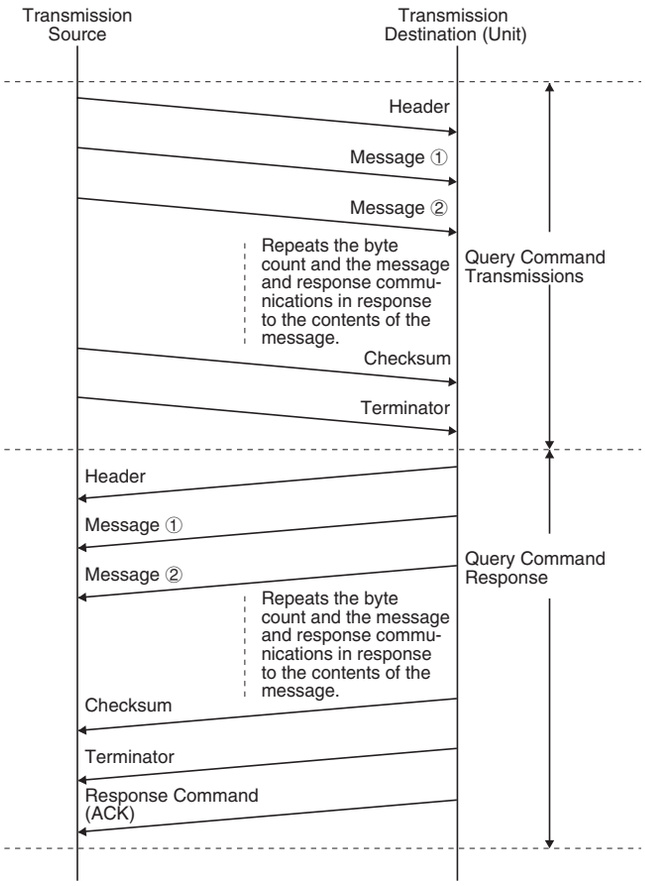
1 During Settings Command



2 During Query Command (Other than ACK)



3 During Query Command (ACK)



[3] Command List for MD800-500

Message			
System	All Initial	A0 01 0A CS FF	Initialization of Unadjusted EEPROM Values (Set to Factory Defaults)
	All Menu Initial	A0 01 0B CS FF	Initialization of All Menu Settings
	Lens Initial	A0 01 0C CS FF	Detection of initial lens position
	Reset	A0 01 0D CS FF	Restarting camera (Saves the setting value)
	Menu Initial	A0 01 0E CS FF	Initialization of menu settings other than privacy mask settings
	Pixel defect compensation	A0 01 12 00 06 04 04 06 00 ↳ 0C CS FF	Applied version 1.21-** or later (Note 8)
	Auto pixel defect compensation at start-up.	A0 01 13 0p CS FF	p: 0:OFF Default , 1:ON Applied version 1.21-** or later ※ Refer to "Communications Protocol [2]Communications Flow"
Zoom	Tele	A0 02 05 CS FF	
	Wide	A0 02 06 CS FF	
	Tele/Wide Stop	A0 02 07 CS FF	
	Tele/Wide Speed	A0 02 08 0p CS FF	p: Speed 1-4 during Tele and Wide commands (1: Slow-4: Fast [Initial value: 3])
	Direct	A0 02 09 0p 0q 0r CS FF	pqr: Direct Position • MD800/700, 0: Wide, 2484: 36x (optical), 2724: 576x (digital) • MD600/500, 0: Wide, 2263: 30x (optical), 2503: 480x (digital) Digital Zoom Tele Limiter command needs to be sent before moving to digital zoom field.
	Zoom Direct with Focus	A0 02 0A 0p 0q 0r 0s 0t 0u ↳ CS FF	pqr:Zoom Direct Position stu:Focus Direct Position For carrying set the focus to the specified position.
	Digital Zoom Tele Limiter	A0 02 18 0p CS FF	p: Maximum digital zoom magnification (0: x0 [Initial value], 1: x2, 2: x4, 3: x8, 4: x16)
	Optical Zoom Wide/Tele Limitter	A0 02 19 xx yy CS FF	Wide/Tele Optical ZOOM Limiter The numbers within the brackets refer to the MD600/500 models xx: 0, 1-35 [29] (0 is no limit and 1-35 [29] is the Wide optical ZOOM limit) yy: 0, 2-36 [30] (0 is no limit and 2-36 [30] is the Tele optical ZOOM limit) Note: Ensure that xx < yy
	V-Reso.UP OFF/ON	A0 02 1F 0p CS FF	p: Increased vertical sensitivity settings during digital zoom OFF/ON (0: OFF, 1: ON) (Note 3)
	Zoom Preset ON	A0 02 28 CS FF	Moves the zoom position to the optical TELE edge
	Zoom Preset OFF	A0 02 29 CS FF	Returns the zoom position to the position before the “Zoom Preset ON” operation
Focus	Auto Focus ON	A0 03 00 CS FF	
	Manual Focus ON	A0 03 01 CS FF	
	One Push Trigger	A0 03 03 CS FF	Operates the auto focus operation once
	Far	A0 03 05 CS FF	
	Near	A0 03 06 CS FF	
	Far/Near Stop	A0 03 07 CS FF	
	Far/Near Speed	A0 03 08 0p CS FF	p: Speed 1-4 during Far and Near commands (1: Slow-4: Fast (Initial value: 2))
	Direct	A0 03 09 0p 0q 0r CS FF	pqr: Direct Position (0: Far 1209: Near)
	Near Limiter	A0 03 0E 0p CS FF	p: Subject distance limit during auto focus and manual focus (0: 10 cm, 1: 30cm, 2: 50 cm, 3: 1 m [Initial value], 4: 3 m, 5: 5 m)
	Auto Focus Sensitivity	A0 03 10 0p CS FF	p: Auto focus restart sensitivity settings (0: LOW/1: HI [Initial value])
	Focus Area	A0 03 13 0p CS FF	Settings Determining Auto Focus Areas 1-3 1: Entire screen-3: Only center of the screen (Initial value: 2)
	Cover Offset OFF/ON	A0 03 15 0p CS FF	p: Offset OFF/ON (0: OFF/1: ON) when using the cover
	Cover Offset Level	A0 03 16 0p 0q CS FF	pq: Offset Level Setting 0 – 00 (Initial value: 5) when using the cover
	Auto Focus Mode during pan/tilt	A0 03 1F 0p CS FF	p: Auto Focus Mode Setting during Pan/Tilt (0: AF/1: Fixed)
White Balance	ATW	A0 04 00 CS FF	Auto White Balance Mode (Same as "0" in WB Mode)
	MWB	A0 04 01 CS FF	Manual White Balance Mode (Same as "2" in WB Mode)
	One Push Trigger (AWC Set)	A0 04 03 CS FF	Executes OnePush in AWC Mode
	AWC Reset	A0 04 04 CS FF	Returns to the original mode only after executing the OnePush Trigger command
	ATW Smart OFF/ON	A0 04 06 0p CS FF	Smart ATW (high color saturation compensation) ON/OFF (OFF: 0 [Initial value], ON: 1) *This mode is valid when WB mode is set to ATW.
	WB Mode	A0 04 07 0p CS FF	p: White Balance Mode 0-5 0: Auto White Balance, 1: AWC Mode (One-Push N/A), 2: Manual White Balance 3: 3200K Fixed Mode, 4: 5600K Fixed Mode, 5: FLUO Mode (4200K Fixed)
	MWB Red +	A0 04 0B CS FF	
	MWB Red -	A0 04 0C CS FF	
	MWB Red Preset	A0 04 0F CS FF	Returns MWB red component settings to factory defaults (Initial value: 64)
	MWB Red Direct	A0 04 13 0p 0q CS FF	pq: Direct MWB red components 0-255
	MWB Blue +	A0 04 15 CS FF	
	MWB Blue -	A0 04 16 CS FF	
	MWB Blue Preset	A0 04 19 CS FF	Returns MWB blue component settings to factory defaults (Initial value: 64)
	MWB Blue Direct	A0 04 1D 0p 0q CS FF	pq: Direct MWB blue components 0-255
	ATW Masking OFF	A0 04 28 CS FF	Mask settings ON/OFF during ATW
	ATW Masking ON	A0 04 29 CS FF	
	ATW Mask Area Clr	A0 04 2D CS FF	Initialization of mask settings during ATW
	ATW Mask Area Set	A0 04 31 0p 0q 0r 0s 0t 0u ↳ 0v 0w 0x 0y 0z 0n CS FF	Mask area settings during ATW (Note 1)
	ATW Mask Display	A0 04 32 0p CS FF	p: Displays the ATW MASK settings status on the monitor. (1: ON/0: OFF)
Iris	Auto IRIS	A0 05 00 CS FF	(Note 3)
	Manual IRIS (EI OFF)	A0 05 01 CS FF	
	Manual IRIS (EI ON)	A0 05 02 CS FF	(Note 3)
	Iris Level +	A0 05 0B CS FF	Iris level operation during auto iris
	Iris Level -	A0 05 0C CS FF	
	Iris Level Preset	A0 05 0F CS FF	Returns iris levels during auto iris to factory defaults (Initial value: 40)
	Iris Level Direct	A0 05 13 0p 0q CS FF	pq: Iris level 0 (Dark) - 100 (Bright) during auto iris (Initial value: 40)
	Manual Iris Stop +	A0 05 15 CS FF	Aperture operation during manual iris (Initial value: 17)
	Manual Iris Stop -	A0 05 16 CS FF	
	Manual Iris Stop Preset	A0 05 19 CS FF	Returns aperture during manual iris to factory default (Initial value: 17)
	Manual Iris Stop Direct	A0 05 1D p CS FF	p: Aperture 1 (Close) - 17 (Open) during manual iris

CS: Checksum
FF: Terminator

Message			
Backlight	BLC OFF	A0 06 00 CS FF	Backlight compensation OFF
	Multi BLC ON	A0 06 01 CS FF	Backlight compensation multifractionated evaluative metering mode (Backlight compensates after measuring the light of the entire screen.)
	Multi BLC Weight -	A0 06 04 00 CS FF	Sensitivity settings during Multi BLC BLC is easier to determine with a larger value (Initial value: 7)
	Multi BLC Weight +	A0 06 04 01 CS FF	
	Multi BLC Weight Preset	A0 06 05 CS FF	Returns sensitivity during Multi BLC to factory defaults (Initial value: 7)
	Multi BLC Weight Direct	A0 06 06 0p CS FF	p: Direct sensitivity settings 0-15 during Multi BLC (Initial value: 7)
	Multi BLC Bright -	A0 06 07 00 CS FF	Brightness settings during Multi BLC Larger value increases brightness when determining BLC (Initial value: 7)
	Multi BLC Bright +	A0 06 07 01 CS FF	
	Multi BLC Bright Preset	A0 06 08 CS FF	Returns brightness settings during Multi BLC to factory defaults (Initial value: 7)
	Multi BLC Bright Direct	A0 06 09 0p CS FF	p: Direct brightness settings 0-15 during Multi BLC (Initial value: 7)
	Center BLC ON	A0 06 0B CS FF	BLC center-weighted metering mode (Backlight compensates after measuring the light mainly in the center.)
	Center BLC Weight Preset	A0 06 0F CS FF	Returns sensitivity settings during Center BLC to factory defaults (Each initial value: 0) * Therefore, Center is always 7
	Center BLC Weight Direct	A0 06 10 0p 0q 0r 0s CS FF	Sensitivity settings during Center BLC p: Top(0-7) q: Bottom(0-7) r: Left(0-7) s: Right(0-7) (Each initial value: 0)
	Center BLC Area Preset	A0 06 12 CS FF	Returns center area settings during Center BLC to factory defaults (Each initial value: 0)
	Center BLC Area Direct	A0 06 13 0p 0q 0r 0s CS FF	Center area settings during Center BLC p: x-position(0-7) q: y-position(0-5) r: x-size(0-7) s: y-size(0-5) (Initial value: x-position: 2 y-position: 1 x-size: 3 y-size: 3) *When x-size:0 y-size:0, it becomes 1 area.
	Center BLC Area Display	A0 06 14 0p 0q CS FF	Displays the Center BLC Area settings status on the monitor. p: Display (0: OFF, 1: ON), q: Displayed area (0: CENTER, 1: TOP, 2: BOTTOM, 3: LEFT, 4: RIGHT) * The area that is not covered with zebra markings shows the setting area.
	Mask BLC ON	A0 06 15 CS FF	BLC mask mode (Backlight compensates after measuring the light, ignoring areas set as mask.)
	Mask BLC Area Preset	A0 06 19 CS FF	Return mask area settings during Mask BLC to factory defaults
	Mask BLC Area Direct	A0 06 1D 0p 0q 0r 0s 0t 0u ↳ 0v 0w 0x 0y 0z 0n CS FF	Mask area settings during Mask BLC (Note 1)
	BLC ON	A0 06 33 CS FF	Returns to the mode before BLC OFF only when BLC OFF
	BLC Mask Display	A0 06 1E 0p CS FF	p: Displays the BLC MASK settings status on the monitor. (1: ON/0: OFF)
Shutter Speed	Shutter Speed +	A0 07 0B CS FF	Increases shutter speed by one notch (Long time mode x 32 – High speed mode 1/10000) (Note 3)
	Shutter Speed -	A0 07 0C CS FF	Decreases shutter speed by one notch (Long time mode x 32 – High speed mode 1/10000) (Note 3)
	Shutter Speed Set long	A0 07 0E 0p CS FF	Shutter Speed Mode Settings (Note 3) 0: Prolonged exposure shutter mode, 1: Normal mode, 3: High speed shutter mode
	Shutter Speed OFF	A0 07 0F CS FF	Returns the shutter speed mode setting to normal mode setting
	Shutter Long Direct	A0 07 11 0p CS FF	Shutter speed settings during prolonged exposure shutter mode (0: x1, 1: x2, 2: x4, 3: x8, 4: x16, 5: x32)
	Shutter Short Direct	A0 07 12 0p CS FF	Shutter speed settings during high speed shutter mode The numbers within the brackets refer to the PAL model (0: 1/60 [1/50], 1:1/100 [1/120], 2: 1/250, 3: 1/500, 4: 1/1000, 5: 1/2000, 6: 1/4000, 7: 1/10000)
	Sense Up +	A0 07 1A CS FF	Increase electronic sensitivity settings (Note 3)
	Sense Up -	A0 07 1B CS FF	
	Sense Up Direct	A0 07 1D 0p CS FF	p: Direct increased electronic sensitivity settings (Note 3) (0: OFF, 1: x2, 2: x4, 3: x8, 4: x16, 5: x32)
	ELS OFF	A0 07 28 CS FF	Sets shutter speed to 1x (1/60 [1/50]) after saving The numbers within the brackets refer to the PAL model
	ELS ON	A0 07 29 CS FF	Returns to electronic shutter speed saved by ELS OFF
Motion Detector	Motion Detector OFF	A0 08 00 CS FF	Motion sensor ON/OFF (Note 3)
	Motion Detector ON	A0 08 01 CS FF	
	Motion Size Preset	A0 08 05 CS FF	Returns detected motion size settings to factory defaults (Initial value: V-Size: 1, H-Size: 1)
	Motion Size Direct	A0 08 06 0p 0q CS FF	Detected motion size settings p: V-Size (1-6) q: H-Size (1-8) 但し、VxH の MAX 9 (Initial value: V-Size: 1, H-Size: 1)
	Motion Size Display	A0 08 07 0p CS FF	p: Displays the MOTION SIZE settings status on the monitor. (1: ON/0: OFF)
	Masking OFF	A0 08 0A CS FF	Mask area settings for motion detection ON/OFF
	Masking ON	A0 08 0B CS FF	
	Mask Area Preset	A0 08 0F CS FF	Returns mask area for motion detection to factory defaults
	Mask Area Direct	A0 08 13 0p 0q 0r 0s 0t 0u ↳ 0v 0w 0x 0y 0z 0n CS FF	Mask area settings for motion detection (Note 1)
	Motion Mask Display	A0 08 14 0p CS FF	p: Displays the MOTION MASK settings status on the monitor. (1: ON/0: OFF)
	Sensitivity Move +	A0 08 15 CS FF	Motion detection sensitivity settings (Initial value: 5) * Smaller values increase the sensitivity to small movements.
	Sensitivity Move -	A0 08 16 CS FF	
	Sensitivity Move Preset	A0 08 19 CS FF	Returns motion detection sensitivity settings to factory defaults (Initial value: 5)
	Sensitivity Move Direct	A0 08 1D 0p CS FF	p: Direct motion detection sensitivity settings 1-10 (Initial value: 5)
	Sensitivity Y-Level +	A0 08 1F CS FF	Minimum brightness settings for motion detection (Initial value: 5) * Smaller values increase the sensitivity to movements even on dark screens.
	Sensitivity Y-Level -	A0 08 20 CS FF	
	Sensitivity Y-Level Peset	A0 08 23 CS FF	Returns minimum brightness settings for motion detection to factory default (Initial value: 5)
	Sensitivity Y-Level Direct	A0 08 27 0p CS FF	p: Direct minimum brightness settings for motion detection 1-10 (Initial value: 5)
	Sensitivity Y-Differ +	A0 08 29 CS FF	Brightness variation settings for undetected motion (Initial value: 5) * Smaller values increase the sensitivity to movements even with large brightness variation.
	Sensitivity Y-Differ -	A0 08 2A CS FF	
	Sensitivity Y-Differ Preset	A0 08 2D CS FF	Returns brightness variation settings for undetected motion to factory defaults (Initial value: 5)
	Sensitivity Y-Differ Direct	A0 08 31 0p CS FF	p: Direct brightness variation settings for undetected motion 1-10 (Initial value: 5)
	Sensitivity Duration +	A0 08 33 CS FF	Continuous movement time for motion detection (Initial value: 1) * Smaller values increase the sensitivity to fast moving subjects.
	Sensitivity Duration -	A0 08 34 CS FF	
	Sensitivity Duration Preset	A0 08 37 CS FF	Returns continuous movement time for motion detection to factory defaults (Initial value: 1)
	Sensitivity Duration Direct	A0 08 3B p CS FF	p: Direct continuous movement time for motion detection 1-60 (Initial value: 1)
	Motion Zoom	A0 08 3D 0p CS FF	p: Zoom magnification during motion detection (Initial value: 0) (0: OFF, 1: x1.4, 2: x2, 3: x2.8, 4: x4, 5: x5.6, 6: x 1/1.4, 7: x 1/2, 8: x 1/2.8, 9: x 1/4, 10: x 1/5.6)
	Motion Interval	A0 08 42 0p CS FF	p: Interval time until the start of next detection during motion detection (Initial value: 0) (0: 5s, 1: 10s, 2: 15s, 3: 20s, 4: 30s, 5: 1m, 6: 2m, 7: 3m, 8: 4m, 9: 5m)

CS: Checksum
FF: Terminator

Message			
Sync	Sync INT	A0 09 00 CS FF	Internal synchronization mode
	Sync L-L	A0 09 01 CS FF	Power supply synchronization mode
	L-L Phase +	A0 09 0B CS FF	Synchronous phase settings for power source synchronization
	L-L Phase -	A0 09 0C CS FF	
	L-L Phase Preset	A0 09 0F CS FF	Returns synchronous phase settings for power source synchronization to factory defaults (Initial value: 0)
	L-L Phase Direct	A0 09 13 0p 0q 0r CS FF	pqr: Synchronous phase settings for power source synchronization Direct 0-524 (NTSC) / 0-624 (PAL) (Initial value: 0)
AGC	COLOR MAX Gain	A0 0A 00 0p CS FF	p: AGC MAX Gain settings during COLOR (0: LOW, 1: NORM, 2: MID, 3: HIGH)
	B/W MAX Gain	A0 0A 01 0p CS FF	p: AGC MAX Gain settings during B/W (0: LOW, 1: NORM, 2: MID, 3: HIGH)
	AUTO MAX Gain	A0 0A 02 0p CS FF	p: AGC MAX Gain settings during AUTO (1: NORM, 2: MID, 3: HIGH)
	AGC ON/OFF	A0 0A 03 0p CS FF	p: AGC ON/OFF switch (Cannot be set to OFF when D/N AUTO or when SENSE UP setting is enabled) (0:OFF, 1:ON) (Note 3)
	COLOR AGC_OFF Gain +	A0 0A 0B CS FF	Gain settings when COLOR and AGC are OFF (Initial value: 0dB)
	COLOR AGC_OFF Gain -	A0 0A 0C CS FF	
	B/W AGC_OFF Gain +	A0 0A 0D CS FF	Gain settings when B/W and AGC are OFF (Initial value: 0dB)
	B/W AGC_OFF Gain -	A0 0A 0E CS FF	
	Gain Preset	A0 0A 0F CS FF	Returns gain settings when AGC is OFF to factory defaults (D/N camera is both COLOR and B/W) (Initial value: 0dB)
	Gain Direct (COLOR)	A0 0A 12 0p CS FF	p: Gain settings when COLOR and AGC are OFF (0: 0dB, 1: 3dB, 2: 6dB, 3: 9dB, 4: 12dB, 5: 15dB, 6: 18dB, 7: 21dB, 8: 24dB, 9: 27dB, 10: 30dB)
	Gain Direct (B/W)	A0 0A 13 0p CS FF	p: Gain settings when B/W and AGC are OFF (0: 0dB, 1: 3dB, 2: 6dB, 3: 9dB, 4: 12dB, 5: 15dB, 6: 18dB, 7: 21dB, 8: 24dB, 9: 27dB, 10: 30dB)
Aperture	OFF	A0 0B 00 CS FF	
	ON	A0 0B 01 CS FF	
	Aperture V +	A0 0B 0B CS FF	Vertical contour compensation settings
	Aperture V -	A0 0B 0C CS FF	
	Aperture V Preset	A0 0B 0F CS FF	Returns vertical contour compensation settings to factory defaults (Initial value: 8)
	Aperture V Direct	A0 0B 13 0p CS FF	p: Vertical contour compensation settings 1-15 (Initial value: 8)
	Aperture H +	A0 0B 15 CS FF	Horizontal contour compensation settings (Initial value: 8)
	Aperture H -	A0 0B 16 CS FF	
	Aperture H Preset	A0 0B 19 CS FF	Returns horizontal contour compensation settings to factory defaults (Initial value: 8)
	Aperture H Direct	A0 0B 1D 0p CS FF	p: Horizontal contour compensation settings 1-15 (Initial value: 8)
Gamma	OFF	A0 0C 00 CS FF	Gamma OFF (1)
	ON	A0 0C 01 CS FF	Gamma ON (0.45)
	SMART1	A0 0C 02 CS FF	Gamma SMART1 (Increases the contrast of dark sections)
	SMART2	A0 0C 03 CS FF	Gamma SMART2 (Further increases the contrast of dark sections)
Mirror	OFF	A0 0D 00 CS FF	Canceling Inversions
	H-Mirror	A0 0D 01 CS FF	Horizontal inversion (Cancels vertical inversion)
	V-Mirror	A0 0D 02 CS FF	Vertical inversion (Cancels horizontal inversion)
	HV-Mirror	A0 0D 03 CS FF	Vertical and horizontal inversions
Privacy Masking	Area Mask OFF	A0 10 00 0p CS FF	p: Mask number 1-15 (All OFF when 0)
	Area Mask ON	A0 10 01 0p CS FF	p: Mask number 1-15 (All ON when 0) * Up to 4 masks can be displayed on a single-screen.
	Privacy Mask Move	A0 10 02 00 0p CS FF	p: Privacy mask angle link (0: OFF, 1: ON) * When set to OFF only Mask numbers 1 – 4 can be used.
	Area Mask Position Clr	A0 10 05 0p CS FF	p: Mask number 1-15 (ALL CLEAR when 0) *Only the "Position setting" is cleared. To make the mask display off, set the Area mask to OFF.
	Area Mask Position Set	A0 10 09 0p 0q 0r 0s 0t 0u ↳ 0v 0w 0x CS FF	Sets the positioning of the mask. Refer to the Privacy Refer to "Function Descriptions [11]Privacy Mask Setting"
	Area Mask Position Center Set	A0 10 0A 0p 0q 0r 0s 0t CS ↳ FF	Sets the mask to the center of the optical axis. (p: mask number 1-15)
	Area Mask Position Full Screen Set	A0 10 0B 0p CS FF	Mask is set the full screen being displayed (p: mask number 1-15)
	Area Mask Degree Set	A0 10 11 0p 0q 0r 0s xt 0u ↳ 0v CS FF	p: Mask No 1-8, qrs: Pan Degree tuv: Tilt Degree * Degree increased x10 and the value input is converted to a hexadecimal number. x: Tilt angle sign bit
Pan/Tilt Degree	Pan/Tilt Degree	A0 11 00 0p 0q 0r xs 0t 0u ↳ CS FF	Current positioning information settings when installing dome camera * The degree is magnified x10, inputs the value changed to a hexadecimal number. pqr: Pan Degree, stu:Tilt Degree, x: Tilt angle sign bit (Note 9)
	Auto Mask Pos. OFF	A0 11 0A CS FF	Privacy mask is set to the information of Pan/TiltDegree positioning and is not moved
	Auto Mask Pos. ON	A0 11 0B CS FF	Privacy mask is set to the information of Pan/TiltDegree positioning and is moved
STILL	OFF	A0 12 00 CS FF	
	ON	A0 12 01 CS FF	Sets the current image to still.

CS: Checksum
FF: Terminator

Message				
OSD	Zoom Ratio	A0 14 00 0p CS FF		p: Zoom magnification display
	Zoom Ratio Position	A0 14 01 p 0q CS FF		Zoom magnification display position p: x-position (0-19) q: y-position (0-11) (Initial value: x: 19 y: 11)
	Direction	A0 14 02 0p CS FF		p: Orientation / angle information display (1: ON/0: OFF) (Note 4)
	Direction Position	A0 14 03 0p 0q CS FF		Positioning of the orientation / angle information display p: x-position (0-11) q: y-position (0-11) ((Initial value: x: 1 y: 11)
	Set North	A0 14 04 0p CS FF		p: Setting the current position to the home position (Orientation: North, PAN angle: 0˚) (1: ON/0: PRESET) (Note 4)
	Rom Version Display	A0 14 10 0p CS FF		p: Version display (1: ON/0: OFF) (Note 6)
Camera ID	OFF	A0 15 00 CS FF		Camera ID display (ON/OFF)
	ON	A0 15 01 CS FF		
	ID SET (ASCII code)	A0 15 09 p q r s t u ↳ v w CS FF		Camera ID settings (Note 5)
	ID X-Position +	A0 15 0B CS FF		Setting the positioning of the Camera ID display (horizontal)
	ID X-Position -	A0 15 0C CS FF		
	ID Y-Position +	A0 15 10 CS FF		Setting the positioning of the Camera ID display (vertical)
	ID Y-Position -	A0 15 11 CS FF		
	Title	A0 15 20 0p CS FF		p: Title display (1: ON/0: OFF)
	Title Set (ASCII code)	A0 15 21 p q r s t u ↳ v w CS FF		Title settings (Note 5)
	Title Position	A0 15 22 0p CS FF		p: Positioning of the title display (1: displayed on the next line from the ID / 0: displayed on the same line)
EEPROM Access	EEPROM Access	A0 19 01 0p 0q 0r 0s 0t CS ↳ FF		Writes the values to the EEPROM pqr: Address 0-2047 st: Data 0-255
Baudrate	19200 bps	A0 1A 00 CS FF		UART communication speed settings Enables after camera restart
	9600 bps	A0 1A 01 CS FF		
	4800 bps	A0 1A 02 CS FF		
	2400 bps	A0 1A 03 CS FF		
	38400 bps	A0 1A 04 CS FF		
ALARM	ALARM OUT OFF	A0 1F 00 CS FF		External alarm output settings (For zoom cameras)
	ALARM OUT ON	A0 1F 01 CS FF		
	LINE OUT OFF	A0 1F 0A CS FF		Alarm output settings to controller (For zoom cameras)
	LINE OUT ON	A0 1F 0B CS FF		
DAY/ NIGHT	D/N COLOR	A0 28 00 CS FF	○	Color Mode
	D/N BLACK/WHITE	A0 28 01 CS FF	○	Black and White Mode
	D/N AUTO	A0 28 02 CS FF	○	Color/Black and White Auto Switch Mode (Note 3)
	D/N BURST OFF	A0 28 03 CS FF	○	Burst Settings ON/OFF
	D/N BURST ON	A0 28 04 CS FF	○	
	D/N LEVEL SET	A0 28 05 0p CS FF	○	p: Color/Black and White Switch Level Settings (0: LOW, 1: MID, 2: HIGH, 3: ADJ) Switch level LOW: Dark – High: Bright ADJ: Manual setting
	D/N ADJ DIRECT (C->B/W)	A0 28 06 0p CS FF	○	Switch Level LOW: Dark-HIGH: Bright ADJ: Manual Settings p: Color □ Black and White Switch Level Manual Settings 0-6 Larger value switches darker sections (Initial value: 4)
	D/N ADJ DIRECT (B/W->C)	A0 28 07 0p CS FF	○	p: Black and White □ Color Switch Level Manual Settings 0-6 Larger value switches darker sections (Initial value: 4)
	D/N FOCUS SET (AUTO)	A0 28 08 0p CS FF	○	p: Focus mode settings during D/N AUTO black and white, 0: Near infrared wavelength compensation (MODE1), 1: Corresponds to optical wavelengths (MODE2)
	D/N FOCUS SET (B/W)	A0 28 09 0p CS FF	○	p: Focus mode settings during D/N BLACK/WHITE, 0: Near infrared wavelength compensation (MODE1), 1: Corresponds to optical wavelengths (MODE2)
	DNR OFF at AGC ON	A0 28 14 CS FF		DNR ON/OFF (Note 3)
	DNR ON at AGC ON	A0 28 15 CS FF		
	D/N Filter Slide Time	A0 28 16 p CS FF	○	p: Changes the D/N filter slide time. (5 – 20 seconds) [Initial value: 0 seconds]
Stabilizer	Stabilizer OFF/ON	A0 33 00 0p CS FF		p: Stabilizer (Stabilizing function) ON/OFF (0: OFF/1: ON) * Only VCC-MD700/800 series
	Stabilizer Level	A0 33 01 0p CS FF		p: Setting the level of the Stabilizer Level (0: Low 1: Middle 2: High) default: 1 * Only VCC-MD700/800 series
Auto Pursuit	Auto Pursuit OFF/ON	A0 34 00 0p CS FF		p: Auto Pursuit ON/OFF (0: OFF/1: ON)
	Auto Pursuit Sensitivity	A0 34 01 0p CS FF		p: Sets the sensitivity to brightness variation when motion is detected 1-F (High sensitivity – Low sensitivity)

CS: Checksum
FF: Terminator
○ : Only MD800/MD600 can be used.

[4] Command List (Query) for MD800-500

Message		Query Command	Response Command		
Zoom	Tele/Wide Speed	80 02 08 CS FF	C0 02 08 0p CS FF	Configured Tele/Wide Speed	1: speed1, 2: speed2, 3: speed3, 4: speed4
	Direct	80 02 09 CS FF	C0 02 09 0p 0q 0r CS FF	Current Zoom Lens Position	Direct Position 0:Wide 2263:Tele
	Digital Zoom Tele Limiter	80 02 18 CS FF	C0 02 18 0p CS FF	Current Digital Zoom Limit	
	V-Reso.UP OFF/ON	80 02 1F CS FF	C0 02 1F 0p CS FF		
Focus	Far/Near Speed	80 03 08 CS FF	C0 03 08 0p CS FF	Configured Far/Near Speed	1: speed1, 2: speed2, 3: speed3, 4: speed4
	Direct	80 03 09 CS FF	C0 03 09 0p 0q 0r CS FF	Current Focus Lens Position	Direct Position 0:Far 1209:Near
	Near Limiter	80 03 0E CS FF	C0 03 0E 0p CS FF		
	Auto Focus Sensitivity	80 03 10 CS FF	C0 03 10 0p CS FF		
	Focus Area	80 03 13 CS FF	C0 03 13 0p CS FF		
	Cover Offset OFF/ON	80 03 15 CS FF	C0 03 15 0p CS FF	Offset ON/OFF setting when using the cover	p: 0:OFF, 1:ON
	Cover Offset Level	80 03 16 CS FF	C0 03 16 0p 0q CS FF	Offset level setting when using the cover	pq: 0 ～ 100
	Auto Focus Mode during pan/tilt	80 03 1F CS FF	C0 03 1F 0p CS FF	Auto focus mode setting during Pan/Tilt	p: 0:AF, 1: Fixed
White Balance	MWB Red Direct	80 04 13 CS FF	C0 04 13 0p 0q CS FF	MWB R Component Set Value	Direct 0-255
	MWB Blue Direct	80 04 1D CS FF	C0 04 1D 0p 0q CS FF	MWB B Component Set Value	Direct 0-255
	ATW Smart OFF/ON	80 04 06 CS FF	C0 04 06 0p CS FF		
	WB Mode	80 04 07 CS FF	C0 04 07 0p CS FF		
Iris	Iris Level Direct	80 05 13 CS FF	C0 05 13 0p 0q CS FF	Iris Level Set Value	Direct 0-100
	Iris Stop Direct	80 05 1D CS FF	C0 05 1D p CS FF	Iris Aperture Set Value	1-17
Blc	Multi BLC Weight Direct	80 06 06 CS FF	C0 06 06 0p CS FF		
	Multi BLC Bright Direct	80 06 09 CS FF	C0 06 09 0p CS FF		
	Center BLC Weight Direct	80 06 10 CS FF	C0 06 10 0p 0q 0r 0s CS FF		
	Center BLC Area Direct	80 06 13 CS FF	C0 06 13 0p 0q 0r 0s CS FF		
Shutter	Shutter Speed Set Mode	80 07 0E CS FF	C0 07 0E 0p CS FF		
	Shutter Long Direct	80 07 11 CS FF	C0 07 11 0p CS FF		
	Shutter Short Direct	80 07 12 CS FF	C0 07 12 0p CS FF		
	Sense Up Direct	80 07 1D CS FF	C0 07 1D 0p CS FF		
Motion	Motion Size Direct	80 08 06 CS FF	C0 08 06 0p 0q CS FF		
	Sensitivity Move Direct	80 08 1D CS FF	C0 08 1D 0p CS FF		
	Sensitivity Y-Level Direct	80 08 27 CS FF	C0 08 27 0p CS FF		
	Sensitivity Y-Differ Direct	80 08 31 CS FF	C0 08 31 0p CS FF		
	Sensitivity Duration Direct	80 08 3B CS FF	C0 08 3B 0p CS FF		
	Motion Zoom	80 08 3D CS FF	C0 08 3D 0p CS FF		
	Motion Interval	80 08 42 CS FF	C0 08 42 0p CS FF		

CS: Checksum
FF: Terminator

Message		Query Command	Response Command		
Sync	L-L Phase Direct	80 09 13 CS FF	C0 09 13 0p 0q 0r CS FF	Power Source Synchronous Set Value	Direct 0-524(NTSC) / 0-624(PAL)
AGC	Max Gain at AGC (COLOR)	80 0A 09 CS FF	C0 0A 09 0p CS FF	AGC MAX Gain Set Value (D/N camera set value when in COLOR)	p: 0:LOW, 1: NORM, 2: MID, 3: HIGH
	Max Gain at AGC (BW)	80 0A 0A CS FF	C0 0A 0A 0p CS FF	AGC MAX Gain Set Value during B/W	p: 0:LOW, 1: NORM, 2: MID, 3: HIGH
	Max Gain at AGC (AUTO)	80 0A 0B CS FF	C0 0A 0B 0p CS FF	AGC MAX Gain Set Value during AUTO	p: 1: NORM, 2: MID, 3: HIGH
	Gain Direct (COLOR)	80 0A 13 CS FF	C0 0A 13 0p CS FF	Gain Settings when COLOR and AGC are OFF	"0: 0dB, 1: 3dB, 2: 6dB, 3: 9dB, 4: 12dB, 5: 15dB, 6: 18dB, 7: 21dB, 8: 24dB, 9: 27dB, 10: 30dB"
	Gain Direct (BW)	80 0A 14 CS FF	C0 0A 14 0p CS FF	Gain Settings when B/W and AGC are OFF	"0: 0dB, 1: 3dB, 2: 6dB, 3: 9dB, 4: 12dB, 5: 15dB, 6: 18dB, 7: 21dB, 8: 24dB, 9: 27dB, 10: 30dB"
	Gain Direct (AGC ON)	80 0A 15 CS FF	C0 0A 15 0p 0q CS FF	Current Gain Value (AGC ON)	pq: 0-120 (pq×0.3dB)
Aperture	Aperture V Direct	80 0B 13 CS FF	C0 0B 13 00 0p CS FF	Vertical Contour Compensation Set Value	1-15
	Aperture H Direct	80 0B 1D CS FF	C0 0B 1D 00 0p CS FF	Horizontal Contour Compensation Set Value	1-15
Gamma	Mode	80 0C CS FF	C0 0C 0p CS FF		p: 0:1, 1:0.45, 2:SMART1, 3:SMART2
Mirror	Mode	80 0D CS FF	C0 0D 0p CS FF		p: 0:OFF, 1:H-Mirror, 2:V-Mirror, 3:HV-Mirror
OSD	Zoom Ratio	80 14 00 CS FF	C0 14 00 0p CS FF	Zoom magnification display	0: OFF/1: ON
	Zoom Ratio Position	80 14 01 CS FF	C0 14 01 p 0q CS FF	Positioning of the zoom magnification display	p: x-position (0-19) q: y-position (0-11)
	Direction	80 14 02 CS FF	C0 14 02 0p CS FF	Orientation / angle information display	0: OFF/1: ON
	Direction Position	80 14 03 CS FF	C0 14 03 0p 0q CS FF	Positioning of the orientation / angle information display	p: x-position (0-11) q: y-position (0-11)
	Set North	80 14 04 CS FF	C0 14 04 0p CS FF	Angle settings	0: not set / 1: set
Camera ID	ID Code	80 15 09 CS FF	C0 15 09 p q r s t u v w CS FF	ASCII code for the camera ID	(Note 5)
	Title	80 15 20 CS FF	C0 15 20 0p CS FF	Title display	0: OFF/1: ON
	Title Code	80 15 21 CS FF	C0 15 21 p q r s t u v w CS FF	ASCII code for the title	(Note 5)
	Title Position	80 15 22 CS FF	C0 15 22 0p CS FF	Positioning of the title display	1: 2 line display / 0: 1 line display
Privacy Masking	Mask Position	80 10 09 0p CS FF	C0 10 09 0p 0q 0r 0s 0t 0u 0v 0w 0x CS FF	Privacy Mask Position	Refer to the Privacy Mask Settings (P29) Refer to "Function Descriptions [11] Privacy Mask Setting"
	Mask Area Center Position	80 10 12 CS FF	C0 10 12 0p 0q 0r 0s CS FF	Coordinates of the central optical axis on the privacy mask coordinates	pq: x-coordinate rs: y-coordinate Refer to "Function Descriptions [11]Privacy Mask Setting"
View Setting	View Setting No	80 18 01 CS FF	C0 18 01 0p CS FF	Current Display View Angle File No.	
EEPROM Access	EEPROM Access	80 19 01 0p 0q 0r CS FF	C0 19 01 0s 0t CS FF	Value Written to EEPROM	pqr: Address 0-2047 st: Data 0-255

CS: Checksum
FF: Terminator

Message		Query Command	Response Command		
DAY/NIGHT	D/N LEVEL	80 28 05 CS FF	C0 28 05 0p CS FF	Color/Black and White Switch Level Set Value	0: LOW, 1: MID, 2: HIGH, 3: ADJ
	D/N ADJ DIRECT (C->B/W)	80 28 06 CS FF	C0 28 06 0p CS FF	Color □ Black and White Switch Level Manual Set Value	0-6
	D/N ADJ DIRECT (B/W->C)	80 28 07 CS FF	C0 28 07 0p CS FF	Black and White □ Color Switch Level Manual Set Value	0-6
	D/N FOCUS SET (AUTO)	80 28 08 CS FF	C0 28 08 0p CS FF	Focus Mode Set Value during D/N AUTO Black and White	0: MODE1, 1: MODE2
	D/N FOCUS SET (B/W)	80 28 09 CS FF	C0 28 09 0p CS FF	Focus Mode Set Value during Black and White	0: MODE1, 1: MODE2
	D/N Filter Slide Time	80 28 0A CS FF	C0 28 0A p CS FF	D/N filter slide time.	p: 5 – 20 seconds
Stabilizer	Stabilizer ON/OFF	80 33 00 CS FF	C0 33 00 0p CS FF	Stabilizer ON/OFF	p: 0:OFF/1:ON * Only VCC-MD700/800 series
	Stabilizer Level	80 33 01 CS FF	C0 33 01 0p CS FF	Stabilizer Level	p: 0:Low/1:Middle/2:High * Only VCC-MD700/800 series
Auto Pursuit	Auto Pursuit OFF/ON	80 34 00 CS FF	C0 34 00 0p CS FF	Auto Pursuit ON/OFF	p: 0:OFF/1:ON
	Auto Pursuit Sensitivity	80 34 01 CS FF	C0 34 01 0p CS FF	Sensitivity to brightness variation at the time of motion detection	p: 1-F High sensitivity – Low sensitivity
Status	Status	80 4A 01 CS FF	C0 4A 01 p q r s t u CS FF	(Note 2)	
	Status type 2	80 4A 02 CS FF	C0 4A 02 p q r s t u v w x y CS FF	(Note 2)	
	Status type 3	80 4A 03 CS FF	C0 4A 03 p q r s t u CS FF	(Note 2)	
	Status type 4	80 4A 04 CS FF	C0 4A 04 p q r s t u v w CS FF	(Note 2)	
	Status type 5	80 4A 05 CS FF	C0 4A 05 p q r s t CS FF	(Note 2)	
	Status type 6	80 4A 06 CS FF	C0 4A 06 0p CS FF	(Note 2)	
	Status type 7	80 4A 07 CS FF	C0 4A 07 0p 0q 0r 0s 0t 0u CS FF	Movement distance for auto pursuit	p: Movement direction (lateral) (1:Right/2:Left) q: Movement direction (vertical) (1:Up/2:Down) rs: Lateral movement distance (%) tu: Vertical movement distance (%)
	Status type 8	80 4A 08 CS FF	C0 4A 08 0p 0q 0r 0s 0t 0u 0v 0w 0x 0y 0z 0n □ CS FF	Motion Detection Area	(Note 1)
	Rom Version	80 4A 0A CS FF	C0 4A 0A 0p 0q 0r 0s 0t 0u 0v 0w CS FF	p-w: Version	

CS: Checksum
FF: Terminator

[5] Command List for MD400 and 300

Message			
System	CAMERA TYPE Unit	A0 01 01 00 CS FF	
	CAMERA TYPE Dome	A0 01 01 01 CS FF	Sanyo Dome Camera ID
	CAMERA TYPE Zoom	A0 01 01 02 CS FF	Sanyo Dome Camera ID
	All Initial	A0 01 0A CS FF	Initialization of Unadjusted EEPROM Values (Set to Factory Defaults)
	All Menu Initial	A0 01 0B CS FF	Initialization of All Menu Settings
	Lens Initial	A0 01 0C CS FF	Detection of initial lens position
	Reset	A0 01 0D CS FF	Restarting camera (Saves the setting value)
	Menu Initial	A0 01 0E CS FF	Initialization of menu settings other than privacy mask settings
Zoom	Tele	A0 02 05 CS FF	
	Wide	A0 02 06 CS FF	
	Tele/Wide Stop	A0 02 07 CS FF	
	Tele/Wide Speed	A0 02 08 0p CS FF	p: Speed 1-4 during Tele and Wide commands (1: Slow-4: Fast [Initial value: 3])
	Direct	A0 02 09 0p 0q 0r CS FF	pqr: Direct Position ・MD400, 0: Wide, 1829: 22x (optical), 2069: 352x (digital) ・MD300, 0: Wide, 2248: 22x (optical), 2488: 352x (digital) Digital Zoom Tele Limiter command needs to be sent before moving to digital zoom field.
	Digital Zoom Tele Limiter	A0 02 18 0p CS FF	p: Maximum digital zoom magnification (0: x0 [Initial value], 1: x2, 2: x4, 3: x8, 4: x16)
	V-Reso.UP OFF/ON	A0 02 1F 0p CS FF	p: Increased vertical sensitivity settings during digital zoom OFF/ON (0: OFF, 1: ON)
	VIEW ANGLE Set *1	A0 02 23 0p CS FF	p: Vignette Reduction Mode Settings (0: OFF, 1: OVER0・1.05x, 2: OVER1・1.06x, 3: OVER 2・1.07x, 4: OVER 3・1.08x, 5: OVER4・1.09x, 6: OVER5・1.10x) (Initial value: 0)
	Zoom Preset ON	A0 02 28 CS FF	Moves the zoom position to the optical TELE edge
	Zoom Preset OFF	A0 02 29 CS FF	Returns the zoom position to the position before the “Zoom Preset ON” operation
Focus	Auto Focus ON	A0 03 00 CS FF	
	Manual Focus ON	A0 03 01 CS FF	
	One Push Trigger	A0 03 03 CS FF	Operates the auto focus operation once
	Far	A0 03 05 CS FF	
	Near	A0 03 06 CS FF	
	Far/Near Stop	A0 03 07 CS FF	
	Far/Near Speed	A0 03 08 0p CS FF	p: Speed 1-4 during Far and Near commands (1: Slow-4: Fast (Initial value: 2))
	Direct	A0 03 09 0p 0q 0r CS FF	pqr: Direct Position (VCC-MD400 0:Far 3524:Near VCC-MD300 0:Far 4008:Near)
	Near Limiter	A0 03 0E 0p CS FF	p: Subject distance limit during auto focus and manual focus (0: 10 cm, 1: 30cm, 2: 50 cm, 3: 1 m [Initial value], 4: 3 m, 5: 5 m)
	Auto Focus Sensitivity	A0 03 10 0p CS FF	p: Auto focus restart sensitivity settings (0: LOW, 1: HI [Initial value], 2: HI+) High+ automatically restarts every 10 seconds (only TELE side) in addition to restarting the change in subject
	Focus Area	A0 03 13 0p CS FF	Settings Determining Auto Focus Areas 1-3 1: Entire screen-3: Only center of the screen (Initial value: 2)
White Balance	ATW	A0 04 00 CS FF	Auto White Balance Mode (Same as "0" in WB Mode)
	MWB	A0 04 01 CS FF	Manual White Balance Mode (Same as "1" in WB Mode)
	One Push Trigger (AWC Set)	A0 04 03 CS FF	Executes OnePush in AWC Mode (Note 7)
	AWC Reset	A0 04 04 CS FF	Returns to the original mode only after executing the OnePush Trigger command
	ATW Smart OFF/ON	A0 04 06 0p CS FF	Smart ATW (high color saturation compensation) ON/OFF (OFF: 0 [Initial value], ON: 1) (Note 7) *This mode is valid when WB mode is set to ATW.
	MWB Red +	A0 04 0B CS FF	
	MWB Red -	A0 04 0C CS FF	
	MWB Red Preset	A0 04 0F CS FF	Returns MWB red component settings to factory defaults (Initial value: 64)
	MWB Red Direct	A0 04 13 0p 0q CS FF	pq: Direct MWB red components 0-255
	MWB Blue +	A0 04 15 CS FF	
	MWB Blue -	A0 04 16 CS FF	
	MWB Blue Preset	A0 04 19 CS FF	Returns MWB blue component settings to factory defaults (Initial value: 64)
	MWB Blue Direct	A0 04 1D 0p 0q CS FF	pq: Direct MWB blue components 0-255
	ATW Masking OFF	A0 04 28 CS FF	Mask settings ON/OFF during ATW
	ATW Masking ON	A0 04 29 CS FF	
	ATW Mask Area Clr	A0 04 2D CS FF	Initialization of mask settings during ATW
	ATW Mask Area Set	A0 04 31 0p 0q 0r 0s 0t 0u ↳ 0v 0w 0x 0y 0z 0n CS FF	Mask area settings during ATW (Note 1)
Iris	Auto IRIS	A0 05 00 CS FF	
	Manual IRIS (EI OFF)	A0 05 01 CS FF	
	Manual IRIS (EI ON)	A0 05 02 CS FF	
	Iris Level +	A0 05 0B CS FF	Iris level operation during auto iris
	Iris Level -	A0 05 0C CS FF	
	Iris Level Preset	A0 05 0F CS FF	Returns iris levels during auto iris to factory defaults (Initial value: 40)
	Iris Level Direct	A0 05 13 0p 0q CS FF	pq: Iris level 0 (Dark) - 100 (Bright) during auto iris (Initial value: 40)
	Manual Iris Stop +	A0 05 15 CS FF	Aperture operation during manual iris (Initial value: 17)
	Manual Iris Stop -	A0 05 16 CS FF	
	Manual Iris Stop Preset	A0 05 19 CS FF	Returns aperture during manual iris to factory default (Initial value: 17)
	Manual Iris Stop Direct	A0 05 1D 0p CS FF	p: Aperture 1 (Close) - 17 (Open) during manual iris

*1: Only MD400 CS: Checksum
*2: Only MD300 FF: Terminator

Message			
Backlight	BLC OFF	A0 06 00 CS FF	Backlight compensation OFF
	Multi BLC ON	A0 06 01 CS FF	Backlight compensation multifractionated evaluative metering mode (Backlight compensates after measuring the light of the entire screen.)
	Multi BLC Weight -	A0 06 04 00 CS FF	Sensitivity settings during Multi BLC BLC is easier to determine with a larger value (Initial value: 7)
	Multi BLC Weight +	A0 06 04 01 CS FF	
	Multi BLC Weight Preset	A0 06 05 CS FF	Returns sensitivity during Multi BLC to factory defaults (Initial value: 7)
	Multi BLC Weight Direct	A0 06 06 0p CS FF	p: Direct sensitivity settings 0-15 during Multi BLC (Initial value: 7)
	Multi BLC Bright -	A0 06 07 00 CS FF	Brightness settings during Multi BLC Larger value increases brightness when determining BLC (Initial value: 7)
	Multi BLC Bright +	A0 06 07 01 CS FF	
	Multi BLC Bright Preset	A0 06 08 CS FF	Returns brightness settings during Multi BLC to factory defaults (Initial value: 7)
	Multi BLC Bright Direct	A0 06 09 0p CS FF	p: Direct brightness settings 0-15 during Multi BLC (Initial value: 7)
	Center BLC ON	A0 06 0B CS FF	BLC center-weighted metering mode (Backlight compensates after measuring the light mainly in the center.)
	Center BLC Weight Preset	A0 06 0F CS FF	Returns sensitivity settings during Center BLC to factory defaults (Each initial value: 0)
	Center BLC Weight Direct	A0 06 10 0p 0q 0r 0s CS FF	Sensitivity settings during Center BLC p: Top(0-7) q: Bottom(0-7) r: Left(0-7) s: Right(0-7) (Each initial value: 0)
	Center BLC Area Preset	A0 06 12 CS FF	Returns center area settings during Center BLC to factory defaults (Each initial value: 0)
	Center BLC Area Direct	A0 06 13 0p 0q 0r 0s CS FF	Center area settings during Center BLC p: x-position(0-7) q: y-position(0-5) r: x-size(0-7) s: y-size(0-5) (Initial value: x-position: 2 y-position: 1 x-size: 3 y-size: 3) *When x-size:0 y-size:0, it becomes 1 area.
	Mask BLC ON	A0 06 15 CS FF	BLC mask mode
	Mask BLC Area Preset	A0 06 19 CS FF	Return mask area settings during Mask BLC to factory defaults
	Mask BLC Area Direct	A0 06 1D 0p 0q 0r 0s 0t 0u ↳ 0v 0w 0x 0y 0z 0n CS FF	Mask area settings during Mask BLC (Note 1)
	BLC ON	A0 06 33 CS FF	Returns to the mode before BLC OFF only when BLC OFF
Shutter Speed	Shutter Speed +	A0 07 0B CS FF	Increases shutter speed by one notch
	Shutter Speed -	A0 07 0C CS FF	Decreases shutter speed by one notch
	Shutter Speed Set long	A0 07 0E 0p CS FF	Shutter Speed Mode Settings 0: Prolonged exposure shutter mode, 1: Normal mode, 3: High speed shutter mode
	Shutter Speed OFF	A0 07 0F CS FF	Same as Shutter Speed Set OFF
	Shutter Long Direct	A0 07 11 0p CS FF	Shutter speed settings during prolonged exposure shutter mode (0: x1, 1: x2, 2: x4, 3: x8, 4: x16, 5: x32)
	Shutter Short Direct	A0 07 12 0p CS FF	Shutter speed settings during high speed shutter mode (0: 1/60 (50), 1:1/100 (120), 2: 1/250, 3: 1/500, 4: 1/1000, 5: 1/2000, 6: 1/4000, 7: 1/10000)
	Sense Up +	A0 07 1A CS FF	Increase electronic sensitivity settings
	Sense Up -	A0 07 1B CS FF	
	Sense Up Direct	A0 07 1D 0p CS FF	p: Direct increased electronic sensitivity settings (0: OFF, 1: x2, 2: x4, 3: x8, 4: x16, 5: x32)
	ELS OFF	A0 07 28 CS FF	Sets shutter speed to 1x (1/60) after saving
	ELS ON	A0 07 29 CS FF	Returns to electronic shutter speed saved by ELS OFF
Motion Detector	Motion Detector OFF	A0 08 00 CS FF	Motion sensor ON/OFF
	Motion Detector ON	A0 08 01 CS FF	
	Motion Size Preset	A0 08 05 CS FF	Returns detected motion size settings to factory defaults (Initial value: V-Size: 1, H-Size: 1)
	Motion Size Direct	A0 08 06 0p 0q CS FF	Detected motion size settings p: V-Size (1-6) q: H-Size (1-8) (Initial value: V-Size: 1, H-Size: 1)
	Alarm Sign OFF	A0 08 08 CS FF	Display ON/OFF during alarm input
	Alarm Sign ON	A0 08 09 CS FF	
	Masking OFF	A0 08 0A CS FF	Mask area settings for motion detection ON/OFF
	Masking ON	A0 08 0B CS FF	
	Mask Area Preset	A0 08 0F CS FF	Returns mask area for motion detection to factory defaults
	Mask Area Direct	A0 08 13 0p 0q 0r 0s 0t 0u ↳ 0v 0w 0x 0y 0z 0n CS FF	Mask area settings for motion detection (Note 1)
	Sensitivity Move +	A0 08 15 CS FF	Motion detection sensitivity settings (Initial value: 5)
	Sensitivity Move -	A0 08 16 CS FF	
	Sensitivity Move Preset	A0 08 19 CS FF	Returns motion detection sensitivity settings to factory defaults (Initial value: 5)
	Sensitivity Move Direct	A0 08 1D 0p CS FF	p: Direct motion detection sensitivity settings 1-10 (Initial value: 5)
	Sensitivity Y-Level +	A0 08 1F CS FF	Minimum brightness settings for motion detection (Initial value: 5)
	Sensitivity Y-Level -	A0 08 20 CS FF	
	Sensitivity Y-Level Peset	A0 08 23 CS FF	Returns minimum brightness settings for motion detection to factory default (Initial value: 5)
	Sensitivity Y-Level Direct	A0 08 27 0p CS FF	p: Direct minimum brightness settings for motion detection 1-10 (Initial value: 5)
	Sensitivity Y-Differ +	A0 08 29 CS FF	Brightness variation settings for undetected motion (Initial value: 5)
	Sensitivity Y-Differ -	A0 08 2A CS FF	
	Sensitivity Y-Differ Preset	A0 08 2D CS FF	Returns brightness variation settings for undetected motion to factory defaults (Initial value: 5)
	Sensitivity Y-Differ Direct	A0 08 31 0p CS FF	p: Direct brightness variation settings for undetected motion 1-10 (Initial value: 5)
	Sensitivity Duration +	A0 08 33 CS FF	Continuous movement time for motion detection (Initial value: 1)
	Sensitivity Duration -	A0 08 34 CS FF	
	Sensitivity Duration Preset	A0 08 37 CS FF	Returns continuous movement time for motion detection to factory defaults (Initial value: 1)
	Sensitivity Duration Direct	A0 08 3B 0p CS FF	p: Direct continuous movement time for motion detection 1-60 (Initial value: 1)
	Motion Zoom	A0 08 3D 0p CS FF	p: Zoom magnification during motion detection (0: OFF, 1: x1.4, 2: x2, 3: x2.8, 4: x4, 5: x6)
	Motion Interval	A0 08 42 0p CS FF	p: Interval time until the start of next detection during motion detection (0: 5s, 1: 10s, 2: 15s, 3: 20s, 4: 30s, 5: 1m, 6: 2m, 7: 3m, 8: 4m, 9: 5m)
Sync	Sync INT	A0 09 00 CS FF	Internal synchronization mode
	Sync L-L	A0 09 01 CS FF	Power supply synchronization mode
	L-L Phase +	A0 09 0B CS FF	Synchronous phase settings for power source synchronization
	L-L Phase -	A0 09 0C CS FF	
	L-L Phase Preset	A0 09 0F CS FF	Returns synchronous phase settings for power source synchronization to factory defaults (Initial value: 0)
	L-L Phase Direct	A0 09 13 0p 0q 0r CS FF	pqr: Synchronous phase settings for power source synchronization Direct 0-524 (NTSC) / 0-624 (PAL) (Each initial value: 0)

*1: Only MD400 CS: Checksum
*2: Only MD300 FF: Terminator

Message				
Camera ID	OFF	A0 15 00 CS FF		Camera ID display
	ON	A0 15 01 CS FF		
	ID SET (ASCII code)	A0 15 09 p q r s t ↳ u v w x y z g h ↳ i j k CS FF		Camera ID settings (Note 5)
	ID X-Position +	A0 15 0B CS FF		Setting the positioning of the Camera ID display (horizontal)
	ID X-Position -	A0 15 0C CS FF		
	ID Y-Position +	A0 15 10 CS FF		Setting the positioning of the Camera ID display (vertical)
	ID Y-Position -	A0 15 11 CS FF		
AGC	COLOR MAX Gain *1	A0 0A 00 0p CS FF		AGC MAX Gain settings during COLOR (0:AGC OFF, 1: -6dB, 2: 0dB, 3: 6dB, 4: 9dB)
	B/W MAX Gain *1	A0 0A 01 0p CS FF		AGC MAX Gain settings during B/W (0:AGC OFF, 1: -6dB, 2: 0dB, 3: 6dB, 4: 9dB, 5:12dB, 6:15dB)
	AUTO MAX Gain *1	A0 0A 02 0p CS FF		AGC MAX Gain settings during AUTO (4: 9dB, 5:12dB, 6:15dB)
	AGC ON/OFF *2	A0 0A 03 0p CS FF		AGC ON/OFF switch (invalid during D/N AUTO) (0:OFF, 1:ON)
	Max Gain at AGC ON *2	A0 0A 09 0p CS FF		AGC MAX Gain settings during AUTO (0: -6dB, 1: 0dB, 2: 6dB, 3: 9dB)
	COLOR AGC_OFF Gain +	A0 0A 0B CS FF		Gain settings when COLOR and AGC are OFF (Initial value: 0dB)
	COLOR AGC_OFF Gain -	A0 0A 0C CS FF		
	B/W AGC_OFF Gain + *1	A0 0A 0D CS FF		Gain settings when B/W and AGC are OFF (Initial value: 0dB)
	B/W AGC_OFF Gain - *1	A0 0A 0E CS FF		
	Gain Preset	A0 0A 0F CS FF		Returns gain settings when AGC is OFF to factory defaults (D/N camera is both COLOR and B/W) (Initial value: 0dB)
	Gain Direct (COLOR) *1	A0 0A 12 0p CS FF		Gain settings when COLOR and AGC are OFF (0: 0dB, 1: 3dB, 2: 6dB, 3: 9dB, 4: 12dB, 5: 15dB, 6: 18dB, 7: 21dB, 8: 24dB, 9: 27dB, 10: 30dB)
	Gain Direct (B/W) *1	A0 0A 13 0p CS FF		Gain settings when B/W and AGC are OFF (0: 0dB, 1: 3dB, 2: 6dB, 3: 9dB, 4: 12dB, 5: 15dB, 6: 18dB, 7: 21dB, 8: 24dB, 9: 27dB, 10: 30dB)
	Gain Direct *2	A0 0A 13 0 CS FF		Gain setting when AGC is OFF (0: 0dB, 1: 3dB, 2: 6dB, 3: 9dB, 4: 12dB, 5: 15dB, 6: 18dB, 7: 21dB, 8: 24dB, 9: 27dB, 10: 30dB)
	DNR OFF at AGC ON *2	A0 0A 14 CS FF		DNR ON/OFF
	DNR ON at AGC ON *2	A0 0A 15 CS FF		
Aperture	OFF	A0 0B 00 CS FF		
	ON	A0 0B 01 CS FF		
	Aperture V +	A0 0B 0B CS FF		Vertical contour compensation settings
	Aperture V -	A0 0B 0C CS FF		
	Aperture V Preset	A0 0B 0F CS FF		Returns vertical contour compensation settings to factory defaults (Initial value: 8)
	Aperture V Direct	A0 0B 13 0p CS FF		p: Vertical contour compensation settings 1-15 (Initial value: 8)
	Aperture H +	A0 0B 15 CS FF		Horizontal contour compensation settings (Initial value: 8)
	Aperture H -	A0 0B 16 CS FF		
	Aperture H Preset	A0 0B 19 CS FF		Returns horizontal contour compensation settings to factory defaults (Initial value: 8)
	Aperture H Direct	A0 0B 1D 0p CS FF		p: Horizontal contour compensation settings 1-15 (Initial value: 8)
Gamma	OFF	A0 0C 00 CS FF		Gamma OFF (1)
	ON	A0 0C 01 CS FF		Gamma ON (0.45)
	SMART1	A0 0C 02 CS FF		Gamma SMART1 (Increases the contrast of dark sections)
	SMART2	A0 0C 03 CS FF		Gamma SMART2 (Further increases the contrast of dark sections)
Mirror	OFF	A0 0D 00 CS FF		Canceling Inversions
	H-Mirror	A0 0D 01 CS FF		Horizontal inversion (Cancels vertical inversion)
	V-Mirror	A0 0D 02 CS FF		Vertical inversion (Cancels horizontal inversion)
	HV-Mirror	A0 0D 03 CS FF		Vertical and horizontal inversions
Privacy Masking	Area Mask OFF	A0 10 00 0p CS FF		p: Mask number 1-8 (ALL OFF when 0)
	Area Mask ON	A0 10 01 0p CS FF		p: Mask number 1-8 (ALL ON when 0)
	Area Mask Position Clr	A0 10 05 0p CS FF		p: Mask number 1-8 (ALL CLEAR when 0) *Only the "Position setting" is cleared. To make the mask display off, set the Area mask to OFF.
	Area Mask Position Set	A0 10 09 0p 0q 0r 0s 0t 0u ↳ 0v 0w 0x CS FF		Refer to "Function Descriptions [11]Privacy Mask Setting"
	Area Mask Position Center Set	A0 10 0A 0p 0q 0r 0s 0t CS ↳ FF		Sets the mask to the center of the optical axis.
	Mask Area Degree Set *2	A0 10 11 0p 0q 0r 0s 0t 0u ↳ 0v CS FF		p: Mask No 1-8, qrs: Pan Degree tuv: Tilt Degree
Pan/Tilt Degree	Pan/Tilt Degree	A0 11 00 0p 0q 0r 0s 0t 0u ↳ CS FF		Current positioning information settings when installing dome camera pqr: Pan Degree, stu:Tilt Degree (Note 9)
	Auto Mask Pos. OFF	A0 11 0A CS FF		Privacy mask is set to the information of Pan/TiltDegree positioning and is not moved
	Auto Mask Pos. ON	A0 11 0B CS FF		Privacy mask is set to the information of Pan/TiltDegree positioning and is moved
STILL	OFF	A0 12 00 CS FF		
	ON	A0 12 01 CS FF		Sets the current image to still.
EEPROM Access	EEPROM Access	A0 19 01 0p 0q 0r 0s 0t CS ↳ FF		Writes the values to the EEPROM pqr: Address 0-2047 st: Data 0-255
Baudrate	19200 bps	A0 1A 00 CS FF		UART communication speed settings Enables after camera restart
	9600 bps	A0 1A 01 CS FF		
	4800 bps	A0 1A 02 CS FF		
	2400 bps	A0 1A 03 CS FF		

*1: Only MD400 CS: Checksum
*2: Only MD300 FF: Terminator

Message				
DAY/ NIGHT	D/N COLOR	*1	A0 28 00 CS FF	Color Mode
	D/N BLACK/WHITE	*1	A0 28 01 CS FF	Black and White Mode
	D/N AUTO	*1	A0 28 02 CS FF	Color/Black and White Auto Switch Mode
	D/N BURST OFF	*1	A0 28 03 CS FF	Burst Settings ON/OFF
	D/N BURST ON	*1	A0 28 04 CS FF	
	D/N LEVEL	*1	A0 28 05 0p CS FF	Color/Black and White Switch Level Settings (0: LOW, 1: MID, 2: HIGH, 3: ADJ) Switch Level LOW: Dark-HIGH: Bright ADJ: Manual Settings
	D/N ADJ DIRECT (C->B/W)	*1	A0 28 06 0p CS FF	p: Color → Black and White Switch Level Manual Settings 0-6 Larger value switches darker sections (Initial value: 4)
	D/N ADJ DIRECT (B/W->C)	*1	A0 28 07 0p CS FF	p: Black and White → Color Switch Level Manual Settings 0-6 Larger value switches darker sections (Initial value: 4)
	D/N FOCUS SET (AUTO)	*1	A0 28 08 0p CS FF	p: Focus mode settings during D/N AUTO black and white, 0: Near infrared wavelength compensation (MODE), 1: Corresponds to optical wavelengths (MODE2)
	D/N FOCUS SET (B/W)	*1	A0 28 09 0p CS FF	p: Focus mode settings during D/N BLACK/WHITE, 0: Near infrared wavelength compensation (MODE), 1: Corresponds to optical wavelengths (MODE2)
	DNR OFF at AGC ON	*1	A0 28 14 CS FF	DNR ON/OFF
	DNR ON at AGC ON	*1	A0 28 15 CS FF	

*1: Only MD400 CS: Checksum
*2: Only MD300 FF: Terminator

[6] Command List (Query) for MD400 and 300

Message		Query Command	Response Command		
Zoom	Tele/Wide Speed	80 02 08 CS FF	C0 02 08 0p CS FF	Configured Tele/Wide Speed	1: speed1, 2: speed2, 3: speed3, 4: speed4
	Direct	80 02 09 CS FF	C0 02 09 0p 0q 0r CS FF	Current Zoom Lens Position	Direct Position D/N Model 0:Wide 2069:Tele Color Model 0:Wide 2488:Tele
Focus	Far/Near Speed	80 03 08 CS FF	C0 03 08 0p CS FF	Configured Far/Near Speed	1: speed1, 2: speed2, 3: speed3, 4: speed4
	Direct	80 03 09 CS FF	C0 03 09 0p 0q 0r CS FF	Current Focus Lens Position	Direct Position D/N Model 0:Far 3524:Near Color Model 0:Far 4008:Near
White Balance	MWB Red Direct	80 04 13 CS FF	C0 04 13 0p 0q CS FF	MWB R Component Set Value	Direct 0-255
	MWB Blue Direct	80 04 1D CS FF	C0 04 1D 0p 0q CS FF	MWB B Component Set Value	Direct 0-255
Iris	Iris Level Direct	80 05 13 CS FF	C0 05 13 0p 0q CS FF	Iris Level Set Value	Direct 0-100
	Iris Stop Direct	80 05 1D CS FF	C0 05 1D 0p CS FF	Iris Aperture Set Value	1-17
Sync	L-L Phase Direct	80 09 13 CS FF	C0 09 13 0p 0q 0r CS FF	Power Source Synchronous Set Value	Direct 0-524(NTSC) / 0-624(PAL)
AGC	Max Gain at AGC (COLOR)	80 0A 09 CS FF	C0 0A 09 0p CS FF	AGC MAX Gain Set Value (D/N camera set value when in COLOR)	0: OFF, 1: -6dB, 2: 0dB, 3: 6dB, 4: 9dB
	Max Gain at AGC (BW)	80 0A 0A CS FF	C0 0A 0A 0p CS FF	AGC MAX Gain Set Value during B/W	0: OFF, 1: -6dB, 2: 0dB, 3: 6dB, 4: 9dB, 5: 12dB, 6: 15dB
	Max Gain at AGC (AUTO)	80 0A 0B CS FF	C0 0A 0B 0p CS FF	AGC MAX Gain Set Value during AUTO	4: 9dB, 5: 12dB, 6: 15dB
	Gain Direct (COLOR)	80 0A 13 CS FF	C0 0A 13 0p CS FF	Gain Settings when COLOR and AGC are OFF	0: 0dB, 1: 3dB, 2: 6dB, 3: 9dB, 4: 12dB, 5: 15dB, 6: 18dB, 7: 21dB, 8: 24dB, 9: 27dB, 10: 30dB
	Gain Direct (BW)	80 0A 14 CS FF	C0 0A 14 0p CS FF	Gain Settings when B/W and AGC are OFF	0: 0dB, 1: 3dB, 2: 6dB, 3: 9dB, 4: 12dB, 5: 15dB, 6: 18dB, 7: 21dB, 8: 24dB, 9: 27dB, 10: 30dB
Aperture	Aperture V Direct	80 0B 13 CS FF	C0 0B 13 00 0p CS FF	Vertical Contour Compensation Set Value	1-15
	Aperture H Direct	80 0B 1D CS FF	C0 0B 1D 00 0p CS FF	Horizontal Contour Compensation Set Value	1-15
Privacy Masking	Mask Position	80 10 09 0p CS FF	C0 10 09 0p 0q 0r 0s 0t 0u CS FF	Privacy Mask Position	Refer to "Function Descriptions [11]Privacy Mask Setting"
OSD MENU	Menu No	80 16 01 CS FF	C0 16 01 0p CS FF	Current Display MENU No.	
View Setting	View Setting No	80 18 01 CS FF	C0 18 01 0p CS FF	Current Display View Angle File No.	
EEPROM Access	EEPROM Access	80 19 01 0p 0q 0r CS FF	C0 19 01 0p 0q 0r 0s 0t CS FF	Value Written to EEPROM	pqr: Address 0-2047 st: Data 0-255

DAY/NIGHT	D/N LEVEL	80 28 05 CS FF	C0 28 05 0p CS FF	Color/Black and White Switch Level Set Value	0: LOW, 1: MID, 2: HIGH, 3: ADJ
	D/N ADJ DIRECT (C->B/W)	80 28 06 CS FF	C0 28 06 0p CS FF	Color → Black and White Switch Level Manual Set Value	0-6
	D/N ADJ DIRECT (B/W->C)	80 28 07 CS FF	C0 28 07 0p CS FF	Black and White → Color Switch Level Manual Set Value	0-6
	D/N FOCUS SET (AUTO)	80 28 08 CS FF	C0 28 08 0p CS FF	Focus Mode Set Value during D/N AUTO Black and White	0: MODE1, 1: MODE2
	D/N FOCUS SET (B/W)	80 28 09 CS FF	C0 28 09 0p CS FF	Focus Mode Set Value during Black and White	0: MODE1, 1: MODE2
Status	Status	80 4A 01 CS FF	C0 46 01 0p 0q 0r 0s 0t 0u CS FF	(Note 2)	
	Status type 2 *1	80 4A 02 CS FF	C0 46 02 0p 0q 0r 0s 0t 0u 0v 0w 0x 0y CS FF		
	Status type 3 *1	80 4A 03 CS FF	C0 46 03 0p 0q 0r 0s 0t 0u CS FF		
	Rom Version	80 4A 0A CS FF	C0 46 0A 0p 0q CS FF	pq: Version	

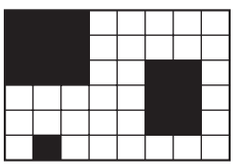
*1: Only MD400 CS: Checksum
*2: Only MD300 FF: Terminator

[7] Notes

Note 1 Area Settings

Divide the screen into 48 areas (6 vertical and 8 horizontal) and set an area to “1” to configure the mask and “0” to not configure the mask. On a row, bits 1 to 4 from the left are on the upper level and bits 5 to 8 are on the lower level. All six rows are connected in order from the top and transmitted according to protocol.

Example: Motion Mask Area Settings (Figure 1)



When setting Figure 1 (the area covered in black shows the position of the mask), transmit in the order described below.

A0	Header
08	Motion Command
13	Motion Area Settings
07	First Row (00000111
00	→0111, 0000)
07	Second Row (00000111
00	→0111, 0000)
07	Third Row (01100111
06	→0111, 0110)
00	Fourth Row (01100000
06	→0000, 0110)
00	Fifth Row (01100000
06	→0000, 0110)
02	Sixth Row (00000010
00	→0010, 0000)
CS	Checksum
FF	Terminator

* The setting commands for the ATW Mask Area, Mask BLC Area are also transmitted using the procedure described above.
* The Motion Detection Area (Query command Status type 8) also responds in the order described above. (The area where motion is detected is set to “1”.)

Note 2 Receiving Status

Refer to the various status commands for contents of the reply when querying the status.

● Status Command 1

	Status1-1	Status1-2	Status1-3	Status1-4	Status1-5	Status1-6
bit0	Digital Zoom (0:OFF/1:ON)	Focus (0:Auto/1:Manual)	Menu Return (0:END/1:RETURN) * Only 22x models	IRIS LEVEL 0-100	Privacy Mask "1" (0:OFF/1:ON)	Privacy Mask "5" (0:OFF/1:ON)
bit1	zoom (0: Stop/1: Operating)	Focus (0: Stop/1: Operating)	Menu(0:OFF/1:ON) * Only 22x models		Privacy Mask "2" (0:OFF/1:ON)	Privacy Mask "6" (0:OFF/1:ON)
bit2	Sens Up (0:OFF/1:ON)	Shutter (0:Long/1:OFF/3:Short)	PAN/TILT Request in Menu (0: No request/1: Request) * Only 22x models		Privacy Mask "3" (0:OFF/1:ON)	Privacy Mask "7" (0:OFF/1:ON)
bit3	Reserve		D/N (0:FIX/1:AUTO)		Privacy Mask "4" (0:OFF/1:ON)	Privacy Mask "8" (0:OFF/1:ON)
bit4	White Balance mode (0:ATW/1;AWC/2:MWB/ 3:Others)	BLC mode (0:OFF/1:Multi/2:Cent/ 3:Mask)	D/N (0:COLOR/1:BW)		Reserve	D/N BURST (0:OFF/1:ON) * Except for 22x models
bit5			Type (0:Normal/1:D/N)		Reserve	
bit6	Mirror (0:OFF 1:ON)	Motion Detection (0: Not detected/1: Detected)	PAL_NT (0:PAL/1:NTSC)		Reserve	Reserve
bit7	0 Fixed	0 Fixed	0 Fixed	0 Fixed	0 Fixed	0 Fixed

● Status Command 2 (Except for MD300)

	Status2-1	Status2-2	Status2-3	Status2-4	Status2-5	Status2-6	Status2-7	Status2-8	Status2-9	Status2-10
bit0	Digital Zoom (0:OFF/1:ON)	Iris Level 0-15	Shutter 0:Long/1:OFF/ 3:Short	Motion Detection (0: Not detected/ 1: Detected)	Reserve	COLOR AGC OFF Gain (0:0dB/1:3dB/ 2:6dB/3:9dB/ 4:12dB/5:15dB/ 6:18dB/7：21dB/ 8:24dB/9:27dB/ 10:30dB)	Camera Address 0-127	0:RS485/1:COAX	Alarm Duration	Alarm Out Time
bit1	Sense Up (0:OFF/1:ON)			AGC (0:OFF/1:ON)	Reserve			Baudrate 0:19200, 1:9600, 2:4800, 3:2400		
bit2	BLC ON/OFF (0:OFF/1:ON)		D/N status (0:COLOR/1:BW)	White Balance 0:ATW,1;AWC, 2:MWB, 3:Others	Reserve					
bit3	Menu ON/OFF * Only 22x models		D/N setting status (0:FIX/1:AUTO)		Reserve			Terminate (0:OFF/1:ON)		
bit4	Reserve	Reserve	Reserve	Reserve	Mirror (0:OFF/1:ON)	PAL_NT (0:PAL/1:NTSC)		Reserve	Alarm in Polarity 0:NO 1:NC	Alarm Out (0:OFF/1:ON)
bit5	Reserve	Reserve	Reserve	Reserve	Reserve	Reserve		Reserve	Alarm Motion Mode 0:OFF,1:AND, 2:OR	Alarm Out Polarity (0:NO/1:NC)
bit6	Reserve	Reserve	Reserve	Reserve	Reserve	Reserve		Reserve		Line Out (0:OFF/1:ON)
bit7	0 Fixed	0 Fixed	0 Fixed	0 Fixed	0 Fixed	0 Fixed	0 Fixed	0 Fixed	0 Fixed	0 Fixed

● Status Command 3 (Only MD400)

	Status3-1	Status3-2	Status3-3	Status3-4	Status3-5	Status3-6
bit0	Camera ROM Version	Group 12	Group 8	Group 1	Reserve	Reserve
bit1		Group 13	Group 9	Group 2	Reserve	Reserve
bit2		Group 14	Group 10	Group 3	Reserve	Reserve
bit3		Group 15	Group 11	Group 4	Reserve	Reserve
bit4		Reserve	Reserve	Group 5	Reserve	Reserve
bit5		Reserve	Reserve	Group 6	Reserve	Reserve
bit6		Reserve	Reserve	Group 7	Reserve	Reserve
bit7	0 Fixed	0 Fixed	0 Fixed	0 Fixed	0 Fixed	0 Fixed

● Status Command 4 (Only MD800/700/600/500)

	Status4-1	Status4-2	Status4-3	Status4-4	Status4-5	Status4-6	Status4-7	Status4-8
bit0	Focus (0:Auto/1:Manual)	Iris mode 0: AI, 1: MI (EI OFF), 2: MI (EI ON)	Motion Settings (0: OFF/1: ON)	Privacy Mask "1" (0:OFF/1:ON)	Privacy Mask "5" (0:OFF/1:ON)	Privacy Mask "9" (0:OFF/1:ON)	Privacy Mask "13" (0:OFF/1:ON)	Day/Night Mode (0:COLOR/1:BW/2:AUTO)
bit1	White Balance mode (0:ATW/1:AWC/ 2:MWB/3:3200/ 4:5600/5:FLUO)		Motion Mask Settings (0: OFF/1: ON)	Privacy Mask "2" (0:OFF/1:ON)	Privacy Mask "6" (0:OFF/1:ON)	Privacy Mask "10" (0:OFF/1:ON)	Privacy Mask "14" (0:OFF/1:ON)	
bit2		BLC mode (0: OFF/1: Multi,/ 2: Cent/3: Mask)	Sync Settings (0: INT, 1: LL)	Privacy Mask "3" (0:OFF/1:ON)	Privacy Mask "7" (0:OFF/1:ON)	Privacy Mask "11" (0:OFF/1:ON)	Privacy Mask "15" (0:OFF/1:ON)	D/N BURST (0:OFF/1:ON)
bit3			Aperture Settings (0: OFF/1: ON)	Privacy Mask "4" (0:OFF/1:ON)	Privacy Mask "8" (0:OFF/1:ON)	Privacy Mask "12" (0:OFF/1:ON)	Reserve	AGC DNR (0:OFF/1:ON)
bit4	WB MASK (0:OFF/1:ON)	Reserve	Auto Mask Pos Settings (0: OFF/1: ON)	Reserve	Reserve	Reserve	Reserve	Reserve
bit5	Reserve	Reserve	Still Settings (0: OFF/1: ON)	Reserve	Reserve	Reserve	Reserve	Reserve
bit6	Reserve	Reserve	Alarm Out Settings (0: OFF/1: ON)	Reserve	Reserve	Reserve	Reserve	Reserve
bit7	0 Fixed	0 Fixed	0 Fixed	0 Fixed	0 Fixed	0 Fixed	0 Fixed	0 Fixed

● Status Command 5 (Only MD800/700/600/500)

	Status5-1	Status5-2	Status5-3	Status5-4	Status5-5
bit0	Upper Average Luminance	Lower Average Luminance	Upper AGC Gain Value	Lower AGC Gain Value	No. of Prolonged Exposure Fields (1-32)
bit1					
bit2					
bit3					
bit4	Reserve	Reserve	Reserve	Reserve	
bit5	Reserve	Reserve	Reserve	Reserve	
bit6	Reserve	Reserve	Reserve	Reserve	Reserve
bit7	0 Fixed	0 Fixed	0 Fixed	0 Fixed	0 Fixed

● Status Command 6 (Only MD800/700/600/500)

	Status6-1
bit0	Motion Detection (0: Not detected, 1: Detected)
bit1	Alarm Output (0: Not output, 1: Output)
bit2	D/N Status (0: Color, 1: BW)
bit3	Reserve
bit4	Reserve
bit5	Reserve
bit6	Reserve
bit7	0 Fixed

Note 3 Exclusive processing

- **Setting to auto iris mode, when SENSE UP is set**

When unable to set

・Cannot be set when the motion sensor is set to ON.
・Cannot be set when auto pursuit is set to ON.

Auto switch setting

・Sets AGC to ON.
・Sets the shutter speed to normal settings.

- **Set to auto switch setting when set to manual iris (EI ON)**

Auto switch setting

・Sets the shutter speed to normal settings.

- **When setting SENSE UP**

(*Valid with auto iris mode)

When unable to set

・Cannot be set when the motion sensor is set to ON.
・Cannot be set when AGC is set to OFF.
・Cannot be set when auto pursuit is set to ON.

Auto switch setting

・Sets the shutter speed to normal settings.
・Changes V-RESO UP to OFF.

- **When setting shutter speed to high-speed shutter mode (SHORT)**

When unable to set

・Cannot be set when set to auto iris and SENSE UP.
・Cannot be set when set to manual iris and EI ON.

- **When setting the shutter speed to long exposure shutter mode (LONG)**

When unable to set

・Cannot be set when set to auto iris and SENSE UP.
・Cannot be set when set to manual iris and EI ON.
・Cannot be set when the motion sensor is set to ON.
・Cannot be set when auto pursuit is set to ON.

Auto switch setting

・Changes V-RESO UP to OFF.

- **When setting the motion setting to ON**

When unable to set

・Cannot be set when set to auto iris and SENSE UP.
・Cannot be set when the shutter speed is set to long exposure shutter mode (LONG).

Auto switch setting

・Changes auto pursuit to OFF.

- **When setting V-RESO UP to ON**

When unable to set

・Cannot be set when the shutter speed is set to long exposure shutter mode (LONG).
・Cannot be set when set to auto iris and SENSE UP.
・Cannot be set when set to AGC ON and DNR ON.

- **When setting DNR to ON (*Valid when AGC ON)**

Auto switch setting

・Changes V-RESO UP to OFF.

- **AWhen setting AGC to OFF**

When unable to set

・Cannot be set when D/N is set to AUTO.
・Cannot be set when set to auto iris and SENSE UP.

- **When setting D/N to AUTO**

Auto switch setting

・Changes AGC to ON.

- **When setting auto pursuit to ON**

When unable to set

・Cannot be set when set to auto iris and SENSE UP.
・Cannot be set when the shutter speed is set to long exposure shutter mode (LONG).

Auto switch setting

・Changes the motion sensor to OFF.

exclusive processing table.

Settings to be changed.→ ↓Current setting.	Auto Iris	V-RESO UP ON	SENSE UP ON	Manual Iris (EI ON)	High speed shutter mode	Prolonged exposure shutter mode	MOTION ON	DNR ON	AGC OFF	D/N AUTO	AUTOPURSUIT ON
Auto Iris		○	○	○	○	○	○	○	○	○	○
V-RESO UP ON	○		V-RESO UP OFF	○	○	V-RESO UP OFF	○	V-RESO UP OFF	○	○	○
SENSE UP ON	△ ※ 1	△ ※ 2		○ (SENSE UP invalid)	△ ※ 3	△ ※ 3	△ ※ 2	○	△ ※ 2	○	△ ※ 2
Manual Iris (EI ON)	Auto Iris EI invalid	○	○ ※ 4		×	×	○	○	○	○	○
High speed shutter mode	○	○	Nomal mode	Nomal mode		Prolonged exposure shutter mode	○	○	○	○	○
Prolonged exposure shutter mode	○	×	Nomal mode	Nomal mode	High speed shutter mode		×	○	○	○	×
MOTION ON	○	○	×	○	○	×		○	○	○	MOTION OFF
DNR ON	○	△ ※ 5	○	○	○	○	○		○ DNR invalid	○	○
AGC OFF	○	○	×	○	○	○	○	○ ※ 6		AGC ON	○
D/N AUTO	○	○	○	○	○	○	○	○	×		○
AUTO PURSUIT ON	○	○	×	○	○	×	AUTO PURSUIT OFF	○	○	○	

○ : Setting change can be done at once.
× : Setting can not be changed.
△ : Enable to change the setting under certain condition.
Other than those above: "Changed setting" becomes valid but "Current setting" will be automatically changed to the settings mentioned in the table.

※ 1 : Unable to set when MOTION ON or AUTO PURSUIT ON. Additionally, AGC will be ON and shutter speed is changed to normal mode.
※ 2 : Enable to set during Manual Iris setting.
※ 3 : Enable to set during Manual Iris (EI OFF) setting.
※ 4 : SENSE UP setting will be invalid. (It will be valid when changing the setting to AUTO Iris.)
※ 5 : Enable to set during AGC OFF.
※ 6 : DNR is invalid.(It will be valid when changing the setting to AGC On.)

Note 4 Orientation / angle display

The display angle is changed using Pan/Tilt Degree commands.
The Set North command sets the current position to N and the pan degree to 0.
Pan angle versus orientation is as follows.

N	337.6-22.5
NE	22.6-67.5
E	67.6-112.5
SE	112.6-157.5
S	157.6-202.5
SW	202.6-247.5
W	247.6-292.5
NW	292.6-337.5

Note 5 How to set the Camera ID and Title

Detailed settings of Camera ID and Title settings are as follows.
Set 8 (16) characters in ASCII code.
Transmit eight (16) characters at the time in order starting with the first character. The following characters may be used.

* The following value (HEX) is also answered as response command to a query command.
* No Title settings are available for models MD400, MD300.
* The numbers within the brackets refer to the VCC-MD400 and MD300 models

Character	Code	(HEX)
(Blank)	32	20
-	45	2D
0	48	30
1	49	31
2	50	32
3	51	33
4	52	34
5	53	35
6	54	36
7	55	37
8	56	38
9	57	39
:	58	3A
A	65	41
B	66	42
C	67	43
D	68	44
E	69	45
F	70	46
G	71	47

Character	Code	(HEX)
H	72	48
I	73	49
J	74	4A
K	75	4B
L	76	4C
M	77	4D
N	78	4E
O	79	4F
P	80	50
Q	81	51
R	82	52
S	83	53
T	84	54
U	85	55
V	86	56
W	87	57
X	88	58
Y	89	59
Z	90	5A

Note 6 Rom Version display

No command other than the Version display ON/OFF command will be received during Version display.
No OSD other than the Version OSD is displayed during Version display.
The display will be erased 3 minutes after the ON command is sent.

Note 7 ATW Smart exclusion processing

In models MD-300, 400 the Onepush Trigger by Onepush Trigger (AWC set) command is not available when setting the ATW Smart.
Before issuing an AWC set command set the ATW Smart to OFF.
If setting the ATW Smart to ON again, do so once the Onepush Trigger operation is complete (3 seconds) or right before sending the ATW command.

Note 8 Pxel defect compensation

When pixel defect compensation function has been executed by command, command transmission cannot be done during the period described below (not sending either ACK/NACK/ERR) :
MD600(P), MD500(P): 15 seconds
MD800(P), MD700(P): 20 seconds

Note 9 Pan/Tilt angle setting

Due to optimization on controlling Auto Focus and Privacy Masks, send same coordinate data at least twice when Pan/Tilt remain stationary.

Note10 Method of model distinguishing

	5th digit in version info	bit5 of 3rd byte in status command
VCC-MD800(P)	5	1
VCC-MD700(P)	5	0
VCC-MD600(P)	4	1
VCC-MD500(P)	4	0

Version Query Command: 80 4A 0A CS FF
Version Response Command:
C0 4A 0A 0p 0q 0r 0s 0t 0u
0v 0w CS FF
↑
x36：5
x30：4
Status Command: 80 4A 01 CS FF
Status Response Command:
C0 4A 01 p q r s t u CS FF
↑
0 b6 b5 b4 b3 b2 b1 b0
↑
D/N ：1
Color：0

*MD400(P), MD300(P) responds error(FC) with commands above.

*Commands below can be used to detect MD400(P) and MD300(P)

Status Command: 80 46 01 CS FF

Status Response Command:

C0 46 01 p q r s t u CS FF

↑

0 b6 b5 b4 b3 b2 b1 b0

↑

D/N (400(P))：1

Color (300(P))：0

[1] Zoom Control

Zoom Position Control

The zoom can be operated using Tele/Wide or moving the zoom to a specific position.

- **Tele/Wide**

  Transmit the Tele or Wide command to execute the Tele/Wide operation at the speed configured by the Tele/Wide Speed command. The Stop command stops the operation. (The operation does not stop without transmitting the Stop command.)

  The speed targets are as follows.

Settings	Required Time (s) from Wide End → Tele End		
	x36 MD700 MD800	x30 MD500 MD600	x22 MD300 MD400
1	11.7	9.9	5.7
2	8.3	6.6	4.9
3	6.8	5.1	4.3
4	5.8	4.2	4.0

- **Direct**

  The Direct command can move the zoom lens to the specified zoom lens position.
  The relation between the zoom lens position and magnification is as follows.
  Digital Zoom Tele Limiter command needs to be sent before the Direct command when moving to digital zoom field.

	Magnification	MD700(P), 800(P)
Optical Area	1x	0
	2x	864
	3x	1232
	4x	1456
	5x	1600
	6x	1709
	7x	1792
	8x	1862
	9x	1920
	10x	1970
	11x	2014
	12x	2054
	13x	2091
	14x	2124
	15x	2156
	16x	2186
	17x	2214
	18x	2241
	19x	2267
	20x	2291
	21x	2314
	22x	2335
	23x	2355
	24x	2373
	25x	2389
	26x	2404
	27x	2418
	28x	2429
	29x	2439
	30x	2449
	31x	2456
	32x	2464
	33x	2470
	34x	2476
	35x	2481
	36x	2484
Electronic Area	72x	2612
	144x	2676
	288x	2708
	576x	2724

	Magnification	MD500(P), 600(P)
Optical Area	1x	0
	2x	813
	3x	1163
	4x	1368
	5x	1508
	6x	1612
	7x	1693
	8x	1760
	9x	1817
	10x	1866
	11x	1909
	12x	1948
	13x	1983
	14x	2015
	15x	2044
	16x	2071
	17x	2096
	18x	2119
	19x	2140
	20x	2158
	21x	2176
	22x	2191
	23x	2205
	24x	2217
	25x	2228
	26x	2238
	27x	2246
	28x	2254
	29x	2260
	30x	2263
Electronic Area	60x	2391
	120x	2455
	240x	2487
	480x	2503

	Magnification	MD300(P)	MD400(P)
Optical Area	1x	0	0
	2x	854	686
	3x	1218	972
	4x	1429	1143
	5x	1573	1271
	6x	1681	1354
	7x	1766	1420
	8x	1837	1482
	9x	1898	1528
	10x	1951	1572
	11x	1998	1612
	12x	2041	1642
	13x	2077	1686
	14x	2110	1700
	15x	2139	1729
	16x	2163	1743
	17x	2184	1772
	18x	2201	1786
	19x	2216	1795
	20x	2229	1800
	21x	2239	1815
	22x	2248	1829
Electronic Area	44x	2376	1957
	88x	2440	2021
	176x	2472	2053
	352x	2488	2069

Optical Zoom Limit Settings

The optical zoom magnification can be limited using the Optical Zoom Tele Limiter command. The digital zoom cannot be used if the limit is set to the Tele side.

Digital Zoom

A maximum of 16x digital zoom can be set with the Digital Zoom Tele Limiter command. Together with the optical zoom, a maximum of 480x is possible, however, the resolution decreases.
Although the vertical resolution can be increased by enabling the V-Reso.UP function using the V-Reso. UP ON command, residual images and blurring may become more apparent with moving subjects.

[2] Focus Control

Manual Focus

The manual focus can be operated using Far/Near or directly moving the focus to a specific position.

- **Far /Near**

  Transmit the Far or Near command to execute the Far/Near operation at the speed configured by the Far/Near Speed command. The Stop command stops the operation. (The operation does not stop without transmitting the Stop command.)
  The speed targets are as follows.

Settings	Required Time (s) from Near End → Far End at the Near Limit 1m and Tele End		
	x36 MD700 MD800	x30 MD500 MD600	x22 MD300 MD400
1	19.7	16.0	19.0
2	10.3	8.3	9.7
3	4.4	3.6	6.6
4	2.4	2.1	5.2

- **Direct**

  The Direct command can move the zoom lens to the specified focus lens position.

- **Auto Focus**

The Auto Focus ON command sets the mode to auto focus and automatically focuses on the subject if the subject moves. This mode is cancelled when the Manual Focus ON, Near, or Far command is used. Although the minimum focus distance is set to 1m by default, this can be changed by using the Near Limiter command. In addition, the sensitivity of the AF to the change in subject can be changed using the Auto Focus Sensitivity command and the focusing area can be changed using the Focus Area command.

One-Push Auto Focus

The auto focus can be moved only once using the One Push Trigger command. The mode prior to starting the auto focus is retained after focusing.

Focus Lens Offset

When covering a camera, such as the dome camera with a cover or similar, the refraction of the light due to the cover changes the OPL. This may result in close subjects being out of focus when using a powerful zoom.
In that case, it is necessary to move the range of motion of the focus lens depending on the change in OPL.
Validate the Offset using the Cover Offset ON command and transmit a Cover Offset Level command so that subjects that are at approximately 1m TELE edge (When the Near Limit is 1m) are in focus.
In the same way that 0 sets the level to OFF, the larger the number, the greater the offset.

[3] White Balance Control

- **ATW**

  Auto Trace White Balance.
  ・SMART ATW

  This mode controls retracing of ATW according to the size of single-colour object in the screen, addition to normal ATW mode control.
  In case the single-colour object covers most of the area in the screen, WB control function shall be stopped.
  Also, the retracing speed is slower than that of normal ATW mode.
  *This mode is valid when WB mode is set to ATW.

- **AWC**

  The Push-Lock Auto White Balance starts retracting using the One Push Trigger command and locks the white balance after approximately 2 seconds.
  In addition, after executing the One Push Trigger command, the mode returns to the previous mode by executing the AWC Reset command.

- **3200K**

  Color temperature 3200K fixed mode.

- **5600K**

  Color temperature 5600K fixed mode.

- **FLUO**

  Color temperature 4200K fixed mode.

- **MWB**

  Manual White Balance. The R and B gains can each be configured to a range of 0 to 255.

[4] IRIS Control

● **Auto Iris**

The lens aperture is automatically controlled to correct the brightness of the average luminance value of the image.

● **Manual Iris**

This fixes the lens aperture. The aperture position can be set to a range of 17 levels (1: close - 7: open) using the Manual IRIS Stop command.

・**EI ON**

The light intensity can be controlled to a fixed level using an electronic shutter control.

Note: Executing the EI ON command sets the shutter speed mode to OFF.

・**EI OFF**

This fixes the electronic shutter. Refer to the Shutter Speed Control on the next page regarding fixed values.

● **Iris Level**

The target brightness can be configured to a range of 0 to 100.

[5] Shutter Speed Control

● **Prolonged Exposure Mode**

The exposure time is a longer mode than 1 field. The field accumulation time can be configured from 1x to 32x.

However, this cannot be configured during the following conditions.

・When SENSE UP is enabled.

・When MOTION settings are enabled.

・When EI is ON.

● **Normal Mode**

This is fixed to 1/60 (1/50).

● **High-Speed Shutter Mode**

This can be configured from 1/60 to 1/10000.

Note 1) If flickering is noticeable in regions with a power supply frequency of 50Hz when using NTSC, switch to the High-Speed Shutter Mode (1/100).

Note 2) When switching to the Prolonged Exposure or High-Speed Shutter Mode, transmit the “Shutter Speed Set Mode” command after the “Shutter Long Direct” or “Shutter Short Direct” command.

● **SENSUP**

If the illumination of the subject decreases, the Prolonged Exposure Control is automatically executed along with the AGC Control.

The maximum Field Accumulation Time can be configured to a range of 1x to 32x.

This cannot be configured during the following conditions.

・When the MOTION settings are valid.

・When AGC is OFF.

In addition, the shutter speed mode is set to OFF.

[6] AGC Control

● **AGC ON**

The gain is automatically controlled and light is fixed to a certain intensity.

The MAX gain of each mode of LOW/NORMAL/MIDDLE/HIGH is roughly equivalent to the following gains.

AGC Gain (dB)

	LOW	NORMAL	MIDDLE	HIGH
AUTO	—	9dB	12dB	15dB
COLOR	1.5dB	6dB	10.5dB	15dB
B/W	6dB	9dB	12dB	15dB

● **AGC OFF**

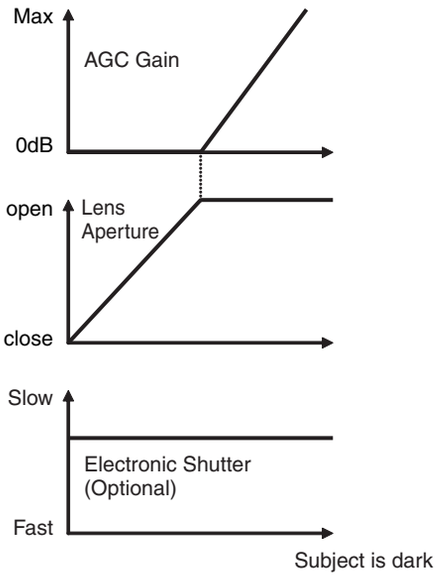
This is the fixed gain mode. The gain value can be manually configured to 11 steps.*

The gain value of each step is roughly equivalent to the following gains.

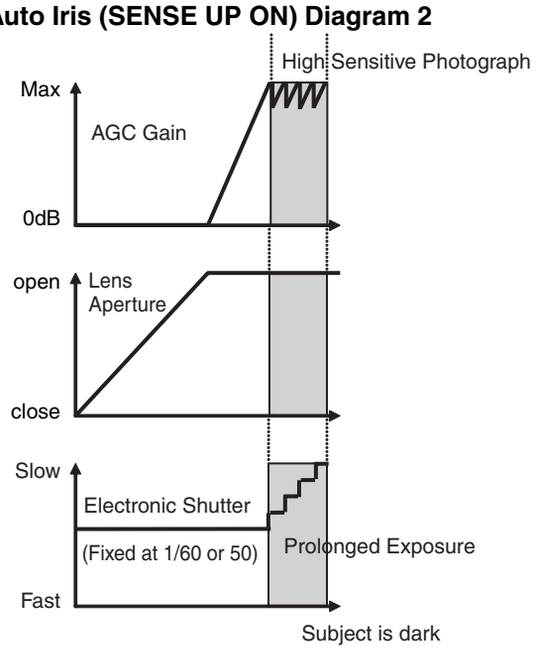
Gain Direct Configuration Value	Gain
0	0dB
1	3dB
2	6dB
3	9dB
4	12dB
5	15dB
6	18dB
7	21dB
8	24dB
9	27dB
10	30dB

Note: When the Day/Night mode is set to AUTO, the AGC OFF cannot be set.

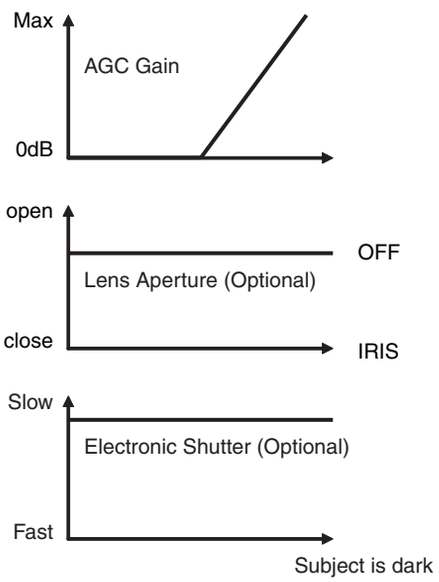
Auto Iris (SENSE UP OFF) Diagram 1



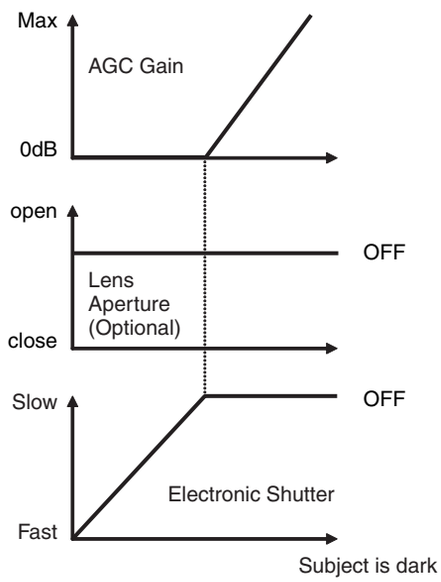
Auto Iris (SENSE UP ON) Diagram 2



Manual Iris (EI OFF) Diagram 3



Manual Iris (EI ON) Diagram 4



[7] Backlight Compensation

● **Multi-Area Light Measuring**

This automatically detects the subject area, the backlight conditions, and automatically corrects the backlight.

The following settings configure sensitivity and the effectiveness of corrections when there is backlight.

・**BLC Weight**

The sensitivity to backlight can be configured to a range of 0 to 15.

Larger values increase the sensitivity to backlight.

・**BLC Bright**

The target brightness value of the subject area when there is backlight can be configured to a range of 0 to 15.

Larger values increase the effectiveness of the correction.

● **Center-weighted metering**

The 48 total areas are divided into 5 and brightness levels are corrected by weighting and calculating each area.

The weight of each area can be configured to a range of 0 to 7. (CENTER is fixed at 7.)

The CENTER position and size can be changed according to the position of the subject.

● **BLC Mask**

By specifying masked areas within the 48 total areas, brightness information of the masked areas is ignored and brightness levels are corrected.

Note: When the Day/Night switch control is set to AUTO mode, the backlight cannot be corrected with multi-area light measuring when the camera is set to B/W.

[8] Aperture

Emphasizes contours and increases the vividness of the entire image.

[9] Motion Detection

The screen is divided into 48 areas (8 x 6) and movement is detected from changes in brightness of representative points within each area.
The detection status can be confirmed by enquiring using the Status command.
In addition, the detection sensitivity can be adjusted by configuring the following items.

- **Sensitivity (MOVE)**
  Sensitivity when determining movement can be configured to a range of 1 to 10. 1 is the most sensitive to movement.

- **Brightness Level (Y-LEVEL)**
  Settings for minimum brightness level when determining movement (Valid for brightness above the configured level)
  The configuration range is 1 to 10. 1 is the most sensitive to the minimum brightness level.

- **Brightness Difference (Y-Differ)**
  Settings for differences in brightness of the 2 images when determining movement (Invalid when exceeding configured brightness differences)
  The configuration range is 1 to 10. 1 is the most sensitive to the difference in maximum brightness.

- **Time Interval (Duration)**
  Time interval settings when determining movement
  The configuration range is 1 to 60. 1 is the most sensitive to minimum time intervals.

- **Time intervals are divided into 5 fields.**
  Movement Assessment Confirmation Mode (TEST)

[10] Day/Night Switch Control

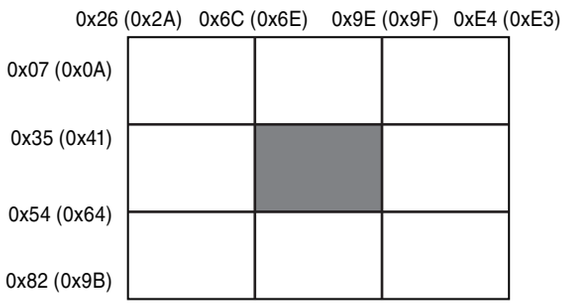
- **AUTO**
  Automatically switches the camera from color images to black and white images depending on the brightness of the day and night. The illumination level at which the camera changes from color images to black and white images can be set to 3 levels (MID, HIGH, LOW) or to manual (ADJ) setting.

- **COLOR**
  Fixes the camera to color images.

- **B/W**
  Fixes the camera to black and white images.

[11] Privacy Mask Settings

Display Area: NTSC (PAL)



*Area initially displayed using the Area Mask ON command.

Notes:

- Minimum unit for the mask width is 4 pixels horizontally and minimum unit for the mask height is 2 lines vertically.
- Up to 4 mask can be displayed within one view angle.
- To correctly hide the masked subject when loading the dome camera, update the PAN/TILT angle interval to within 75 ms.

Area Mask Degree Set

Command: A0 10 11 0p 0q 0r 0s xt 0u 0v CS FF
Parameter:

p	Mask Number (No. 1-15)
qrs	Pan Angle (0°-360°)
x	Tilt angle sign bit
tuv	Tilt Angle (0°-180°)

Usage: Sets the angle of the specified mask numbers.

Note: Set using a pan angle range of 0°-360° and a tilt angle range of –180°-180°. (Refer to the diagram on the right)
In addition, when setting a negative tilt angle set the tilt angle code bit x to 1.

Area Mask Position Set

Command: A0 10 09 0p 0q 0r 0s 0t 0u 0v 0w 0x CS
↳ FF

Parameter:

p	Mask Number (No. 1-15)
qr	x-Coordinate Start Position
st	y-Coordinate Start Position
uv	x-Coordinate End Position
wx	y-Coordinate End Position

Usage: Sets the position of the specified mask numbers.

Note: Set the mask size to sufficiently cover the mask object. In addition, ensure that the settings are set on the WIDE end.

*Query Command Mask Position responds in the same parameter as described above.

Details of the Mask Angle and Position

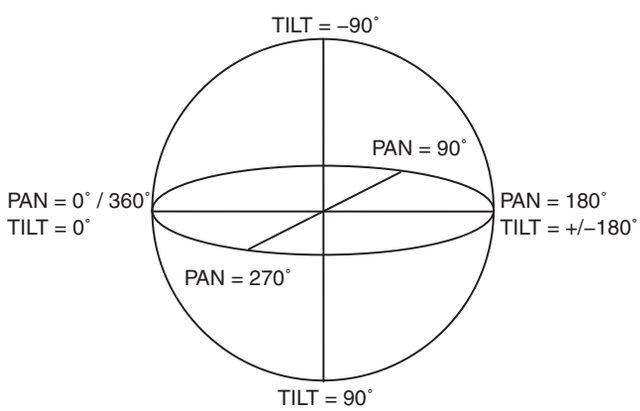
Setting the Mask Angle (Area Mask Degree Set)

The angle is displayed as 12 bits and divided into 4-bit units when increased by a magnification of 10.

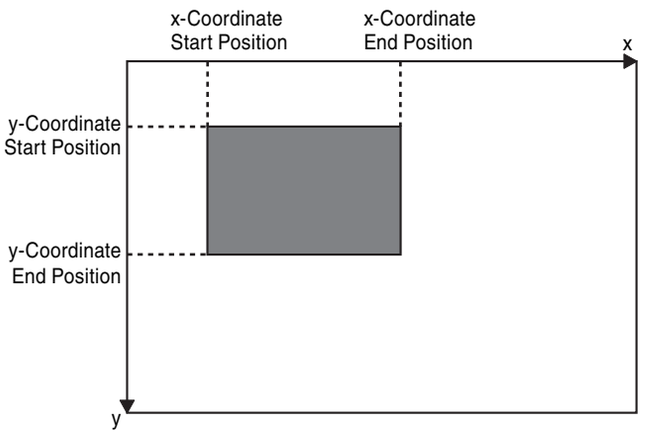
Example) Setting the mask angle according to the following parameters during NTSC

Mask Number	1
Pan Angle	135°
Tilt Angle	45°

Pan Angle:
1350 → 0x0546 → q = 5, r = 4, s = 6
Tilt angle sign bit:
If the tilt angle is positive → x = 0
Tilt Angle:
450 → 0x01C2 → t = 1, u = C, v = 2
Transmitted according to the following.
A0 10 11 01 05 04 06 01 0C 02 CS FF
According to the setting above, if the tilt angle only is set to -45 degrees the following codes are transmitted.
A0 10 11 01 05 04 06 11 0C 02 CS FF



Setting the Mask Position (Area Mask Position Set)



If the coordinates increase by 1, the position moves by 4 horizontal pixels and 2 vertical lines.
The upper left and lower right horizontal and vertical coordinates (1 byte each) are each divided into upper and lower 4 bits.

Example) Setting the mask position according to the following parameters during NTSC

Mask Number	1
x-Coordinate Start Position	0x48
y-Coordinate Start Position	0x1C
x-Coordinate End Position	0x82
y-Coordinate End Position	0x40
Pan Angle	135°
Tilt Angle	45°

Setting Procedures
1. Mask Position (x, y coordinates) Settings
   (Area Mask Position Set)
   A0 10 09 01 04 08 01 0C 08 02 04 00 CS FF
2. Mask Angle Settings (only during PTZ)
   (Area Mask Degree Set)
   A0 10 11 01 05 04 06 01 0C 02 CS FF
3. Setting Mask ON (Area Mask ON)
   A0 10 01 01 CS FF

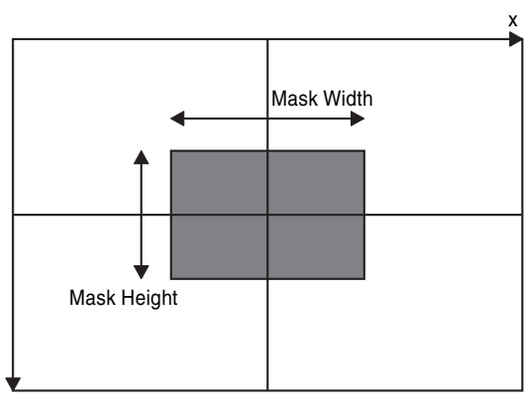
Settings Increasing Privacy Mask Accuracy (MD800-MD500)
Area Mask Position Center Set

Command: A0 10 0A 0p 0q 0r 0s 0t CS FF
Parameter:

p	Mask Number (No. 1-15)
qr	Mask Width
st	Mask Height

Usage: Sets the mask position mainly according to the optical.

Note: Set the mask size to sufficiently cover the mask object. In addition, ensure that the settings are set on the WIDE end.
The minimum unit of the mask width is 4 horizontal pixels and the minimum unit of the mask height is 2 vertical lines.



Example) Setting the mask position according to the following parameters during NTSC

Mask Number	1
Mask Width	0x50
Mask Height	0x3C
Pan Angle	135°
Tilt Angle	45°

Setting Procedures
1. Mask Position (width and height) Settings
   (Area Mask Position Center Set)
   A0 10 0A 01 05 00 03 0C CS FF
2. Mask Angle Settings (only during PTZ)
   (Area Mask Degree Set)
   A0 10 11 01 05 04 06 01 0C 02 CS FF
3. Setting Mask ON (Area Mask ON)
   A0 10 01 01 CS FF

[12] Stabilizer

(Only VCC-MD700/800 series)

When this function is set to ON, the digital zoom magnifies the screen. When vibrations are detected, the vibrations are stabilized by changing the position of the screen captured by the zoom.

Stabilizer level and digital zoom magnification
When changing the stabilizer level, the magnification of the applied digital zoom is changed. Therefore, increasing the stabilizer level allows the camera to adjust to stronger vibrations. However, the screen resolution decreases.
The relation between the level of stabilization and the digital zoom magnification is as follows.

Stabilizer level	Applicable digital zoom magnification
Low	Approximately x1.05
Middle	Approximately x1.1
High	Approximately x1.2

Frequency that can be stabilized

This function corrects vibrations between 5Hz – 15Hz. However, depending on the strength of the vibration or the stabilizer level, some vibrations within this frequency range may not be stabilized.

To clarify the image when using the stabilizer

To clarify the image when using the stabilizer, set the shutter speed to approximately 1/250.
If the shutter speed is slow, the images captured before the digital zoom is applied will be blurred and the effect of the stabilizer decreased.

[13] Auto Pursuit Function

Detects movement on the screen and calculates the level of movement.

Subject pursued: Walking person
Area:1x Zoom, object = a person at 8m distance
Speed: 4km/hour - 6km/hour

Motion detection: Uses the motion detection function
Detection area: 16 x 12, total of 192 blocks
Detection conditions: Continuous movement detection area

Auto Pursuit ON/OFF Setting
Sets auto pursuit to ON/OFF.
Command: A0 34 00 0p CS FF
p: OFF: 0、ON: 1

Auto Pursuit Sensitivity Setting
Sets the sensitivity to brightness variation when detecting motion.
Higher sensitivity increases motion detection through less brightness variation.

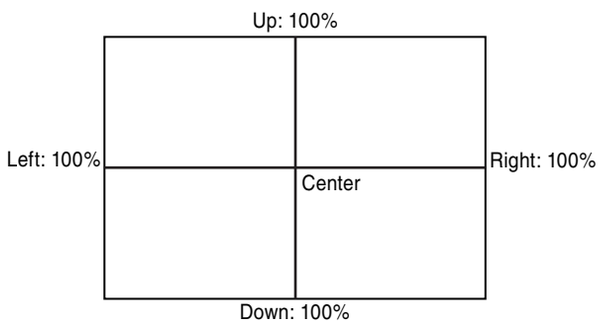
Command: A0 34 01 0p CS FF
p: 1-F (High sensitivity – Low sensitivity)

Note:
- When auto pursuit is set to ON, the ALARM MOTION setting is forcibly set to OFF.
- Pursues the largest moving subject when several moving subjects are detected within one angle.
- For Day/Night models, when the IR cut filter is in operation the moving subject is not pursued.
- When the zoom lens, focus lens are in operation, the moving subject is not pursued.。
- When the PAN/TILT information is changed, the moving subject is not pursued
- When LONG SHUTTER, SENSE UP is set, auto pursuit cannot be set to ON.

Moving Distance Query Command

Returns the distance to the distance derived from the center of gravity of the moving subject. This value represents the distance. Calculate the PAN/TILT distance adequately using this value.

Command: 80 4A 07 CS FF
Response: C0 4A 07 0p 0q 0r 0s 0t 0u
↳ CS FF
Parameter description:
p: Movement direction (Lateral) (1: Right, 2: Left)
q: Movement direction (Vertical) (1: Up、2: Down)
rs: Lateral movement distance (%)
tu: Vertical movement distance (%)



Example: when p = 0x01, q = 0x01, rs = 0x64, tu = 0x64, the PAN/TILT moves right: 100%, up: 100%. Control the PAN/TILT moving distance so that the subject in the top right corner is in the Center.

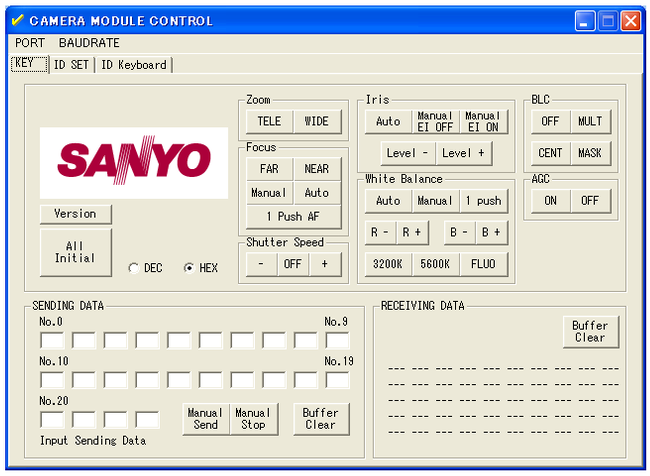
The minimum transmission interval of movement distance query command is 150msec.

Application Software

[1] Camera Control Command Transmission

1-1 Control using the Command Button

The camera unit can be controlled by clicking the various command buttons.
The command data transmitted and received by the PC can be confirmed using the “SENDING DATA” and “RECEIVING DATA” windows.



Command Button	Operation
Zoom (TELE/WIDE)	Controls the ZOOM function. Press down the button to start the ZOOM function. Release the button to stop the ZOOM function.
Focus (FAR/NEAR)	Controls the FOCUS function. Press down the button to start the FOCUS function. Release the button to stop the FOCUS function.
Focus (Auto/Manual/1PushAF)	Selects the FOCUS function mode.
Shutter Speed (Shutter Speed) (−/OFF/+)	Selects the shutter speed function mode. Click the OFF button to return to initial settings.
Iris (Auto/Manual EI OFF/Manual EI ON)	Selects the iris function mode.
Iris (Level−/Level+)	Selects the iris level.
White Balance (Auto/Manual/1 push/3200K/5600K/FLUO)	Selects the white balance mode.
White Balance (R−/R+/B−/B+)	Use the color R and B levels to adjust the white balance according to lightening conditions.
BLC (OFF/MULT/CENT/MASK)	Selects the BLC mode.
AGC (ON/OFF)	Selects the AGC mode. (AGC OFF is invalid when Day/Night is set to AUTO.)
Version	Displays the version of the connected camera.

1-2 Input Command Data Controls (Refer to the command list)

The camera unit can be controlled by entering the command data into the PC.
Enter a specific protocol in the box within the “SENDING DATA” window (starting from box No.0).
The camera is operated by clicking the “Manual Send” button. Similar to Item 1-1 (control using command button), the data received from the camera can be confirmed in the “RECEIVING DATA” window.
In addition, display can be switched between a decimal/hexadecimal number display using “DEC”, “HEX”.

[2] Communications Error

An error message displays when a communications error occurs and communication between the camera and PC stops for several seconds.
Communication can be stopped manually by clicking the “Manual Stop” button.

[3] RS-232C Port

Select the port to connect the RS-232C cable from COM1 to COM4 using the “Port” button

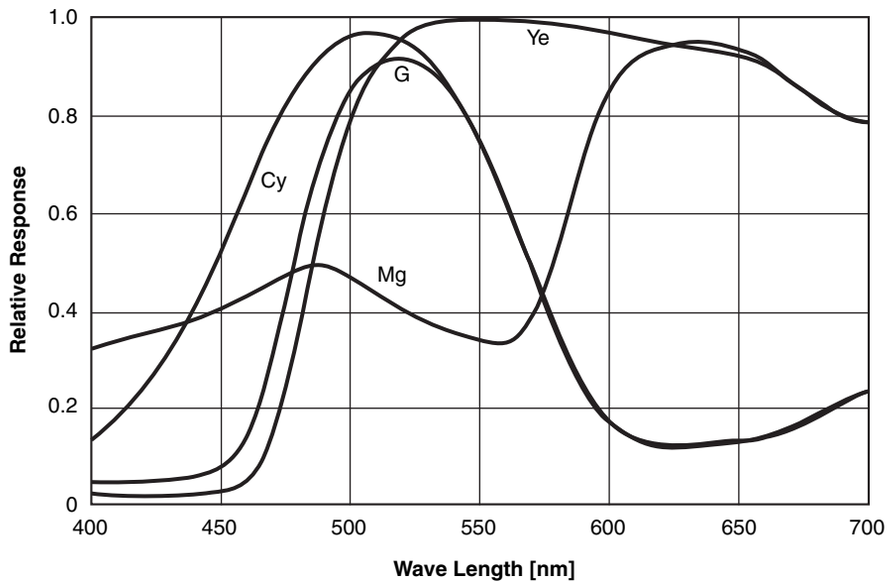
[4] BAUDRATE

Select the communication speed using the “BAUDRATE” button.

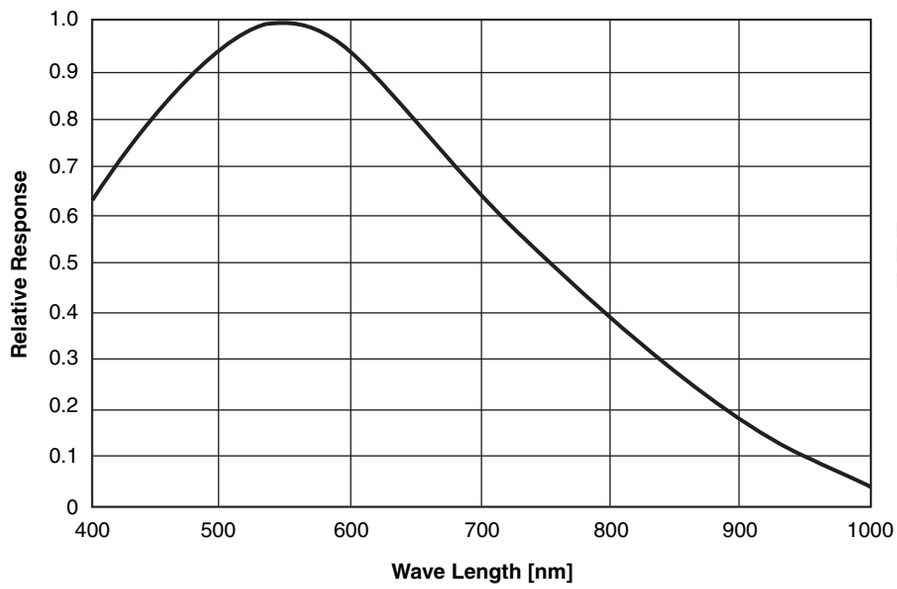
[5] ID SET, ID Keyboard

The camera ID can be set in the “ID SET”, “ID Keyboard” tabs.
(Does not apply to MD-300, 400 models)

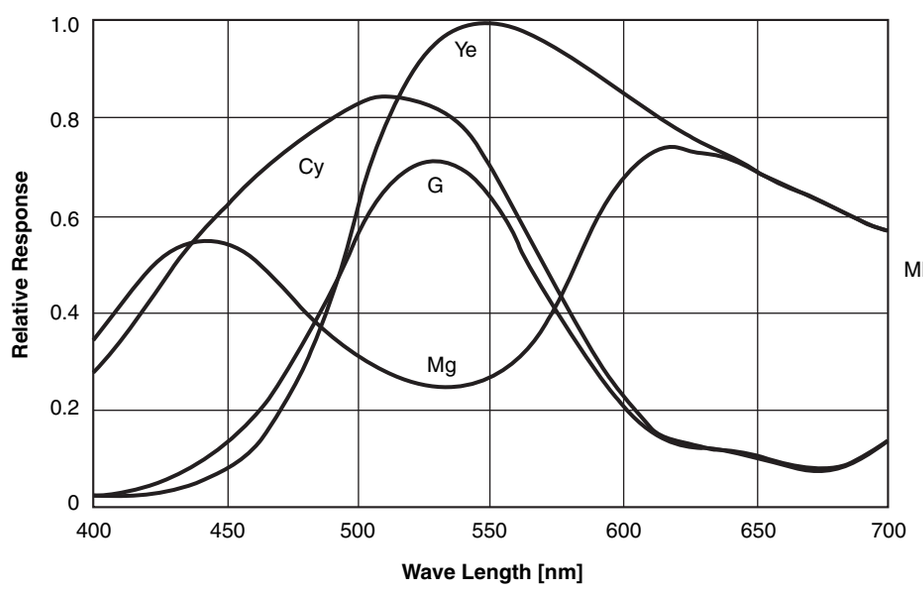
Spectral Sensitivity Characteristics



MD800(P) (Color Mode)
MD700(P)
MD600(P) (Color Mode)
MD500(P)
MD400(P) (Color Mode)



MD800(P) (Night Mode)
MD600(P) (Night Mode)
MD400(P) (Night Mode)



MD300(P)

Specifications

• NTSC system

Model		VCC-MD800	VCC-MD700	VCC-MD600	VCC-MD500	VCC-MD400	VCC-MD300
		36x ZOOM		30x ZOOM		22x ZOOM	
		Day/night	Color	Day/night	Color	Day/night	Color
Image size		1/4" interline transfer CCD					
Effective picture elements		768(H) x 494(V)					
Lens		36x optical zoom f=3.4–122.4 mm, F1.6–4.5		30x optical zoom f=3.5–105 mm, F1.4–3.7		22x optical zoom f=3.6–79.2 mm, F1.6–3.8	22x optical zoom f=4–88 mm, F1.6–3.8
View angle	Horizontal	57.8° to 1.7°		56.4° to 2.0°		47.9° to 2.3°	47.3° to 2.2°
	Vertical	43.7° to 1.3°		43.3° to 1.3°		36.9° to 1.7°	36.3° to 1.4°
	Diagonal	71.1° to 2.0°		68.1° to 2.3°		58.1° to 2.8°	57.4° to 2.5°
Digital zoom		16x					
Resolution		520 TV lines					
Minimum illumination		1.0lx (F1.6, color, gain: max.)	1.0lx (F1.6, gain: max.)	0.8lx (F1.4, color, gain: max.)	0.8lx (F1.4, gain: max.)	1.2lx (F1.6, color, gain: max.)	2.0lx (F1.6, gain: max.)
		0.05lx (F1.6, B/W, gain: max.)	–	0.04lx (F1.4, B/W, gain: max.)	–	0.06lx (F1.6, B/W, gain: max.)	–
		0.0015lx (F1.6, B/W, 32x)	–	0.0013lx (F1.4, B/W, 32x)	–	0.002lx (F1.6, B/W, 32x)	–
S/N ratio		more than 50dB (AGC OFF)					
Synchronizing system		Internal/External (Vsync)					
Auto focus		Auto/One-push AF/Manual					
Day/Night function		Auto/Color/B/W	–	Auto/Color/B/W	–	Auto/Color/B/W	–
Image stabilizer		On/Off		–		–	–
White balance		ATW/Manual/Push-Look/In-door/Out-door/Fluorescent				ATW/Manual/Push-Look	
AGC		Low/Normal/Middle/High/Off				On (adjust gain)/Off	
Backlight compensation		Multi/Center/Off					
Electronic shutter speed		(Fast) 1/60, 1/100, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000sec (Slow) 1x, 2x, 4x, 8x, 16x, 32x					
Electronic sensitivity		Auto/Off, max 32 times					
Privacy masking		On/Off, max of 15 masked locations (Wide view screen; 1 screen max 4 masks)					
Mirror image effect		H/V/HV/Off					
Image freeze		On/Off					
Motion detector		On/Off, with motion zoom function					
Video output		1.0 Vp-p/75 ohms (composite), Y/C output (option)					
Communication		RS-232C (TTL level)					
Operating temperature		–10 to 50˚C					
Power source		6–12V DC (Recommendation: DC9V)				9–12V DC	
Power consumption		DC6V: 2.4W DC9V：2.8W（3.1W ,motors active） DC12V: 3.2W (3.5W, motors active)		DC6V: 2.1W DC9V：2.5W（3.1W ,motors active） DC12V: 2.8W (3.4W, motors active)		450mA/12V DC	
Dimensions		50(W) x 60(H) x 86.2(D) mm		50(W) x 60(H) x 87.5(D) mm		50(W) x 60(H) x 89.5(D) mm	
Weight		Approx. 240g				Approx. 230g	

Specifications

• PAL system

Model		VCC-MD800P	VCC-MD700P	VCC-MD600P	VCC-MD500P	VCC-MD400P	VCC-MD300P
		36x ZOOM		30x ZOOM		22x ZOOM	
		Day/night	Color	Day/night	Color	Day/night	Color
Image size		1/4" interline transfer CCD					
Effective picture elements		752(H) x 582(V)					
Lens		36x optical zoom f=3.4–122.4 mm, F1.6–4.5		30x optical zoom f=3.5–105 mm, F1.4–3.7		22x optical zoom f=3.6–79.2 mm, F1.6–3.8	22x optical zoom f=4–88 mm, F1.6–3.8
View angle	Horizontal	57.8° to 1.7°		56.4° to 2.0°		47.9° to 2.3°	47.3° to 2.2°
	Vertical	43.7° to 1.3°		43.3° to 1.3°		36.9° to 1.7°	36.3° to 1.4°
	Diagonal	71.1° to 2.0°		68.1° to 2.3°		58.1° to 2.8°	57.4° to 2.5°
Digital zoom		16x					
Resolution		520 TV lines					
Minimum illumination		1.0lx (F1.6, color, gain: max.)	1.0lx (F1.6, gain: max.)	0.8lx (F1.4, color, gain: max.)	0.8lx (F1.4, gain: max.)	1.2lx (F1.6, color, gain: max.)	2.0lx (F1.6, gain: max.)
		0.05lx (F1.6, B/W, gain: max.)	–	0.04lx (F1.4, B/W, gain: max.)	–	0.06lx (F1.6, B/W, gain: max.)	–
		0.0015lx (F1.6, B/W, 32x)	–	0.0013lx (F1.4, B/W, 32x)	–	0.002lx (F1.6, B/W, 32x)	–
S/N ratio		more than 50dB (AGC OFF)					
Synchronizing system		Internal/External (Vsync)					
Auto focus		Auto/One-push AF/Manual					
Day/Night function		Auto/Color/B/W	–	Auto/Color/B/W	–	Auto/Color/B/W	–
Image stabilizer		On/Off		–		–	–
White balance		ATW/Manual/Push-Look/In-door/Out-door/Fluorescent				ATW/Manual/Push-Look	
AGC		Low/Normal/Middle/High/Off				On (adjust gain)/Off	
Backlight compensation		Multi/Center/Off					
Electronic shutter speed		(Fast) 1/50, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000sec (Slow) 1x, 2x, 4x, 8x, 16x, 32x					
Electronic sensitivity		Auto/Off, max 32 times					
Privacy masking		On/Off, max of 15 masked locations (Wide view screen; 1 screen max 4 masks)					
Mirror image effect		H/V/HV/Off					
Image freeze		On/Off					
Motion detector		On/Off, with motion zoom function					
Video output		1.0 Vp-p/75 ohms (composite), Y/C output (option)					
Communication		RS-232C (TTL level)					
Operating temperature		–10 to 50˚C					
Power source		6–12V DC (Recommendation: DC9V)				9–12V DC	
Power consumption		DC6V: 2.4W DC9V:2.8W(3.1W ,motors active) DC12V: 3.2W (3.5W, motors active)		DC6V: 2.1W DC9V:2.5W(3.1W ,motors active) DC12V: 2.8W (3.4W, motors active)		450mA/12V DC	
Dimensions		50(W) x 60(H) x 86.2(D) mm		50(W) x 60(H) x 87.5(D) mm		50(W) x 60(H) x 89.5(D) mm	
Weight		Approx. 240g				Approx. 230g	

1AC6P1P3146--
L5BT2/XE, US2 (0307KR)

Change history

2006.12.20: the issue of ver 1.00

2007.02.15: the issue of ver 1.01

- Changes the DEFAULT communication speed (BAUDRATE) of the MD800 – 500 to 9600 bps.
- Newly added commands.
  Cover Offset OFF/ON
  Cover Offset Level
  Auto Focus Mode during pan/tilt
  ATW Mask Display
  Center BLC Area Display
  BLC Mask Display
  Motion Size Display
  Motion Mask Display
  D/N Filter Slide Time
  Status type 7
  Status type 8
- Newly added stabilizer function command and function description (only MD700/800 can be used).
- Newly added auto pursuit function command and function description.
- Newly added exclusive processing note.
- Newly added focus lens offset function description.
- Newly added icon of application software and description postscript.
- Revised privacy mask setting note.
- Revised power source, power consumption specifications.

2007.05.10: the issue of ver 1.02

- Newly added commands.
  OSD setting command (MD500 – 800 only)
  Camera ID setting command
  Area Mask Position Full Screen Set (MD 500-800 only)
  Mask Area Center Position (MD 500-800 only)
- The privacy mask maximum setting value has been increased from 8 to 15. (MD 500-800 only)
- The tilt degree range of the Privacy Masking, Pan/Tilt Degree command has been expanded to: –180 to 180 degrees. The related commands and instructions have been revised. (MD500-800 only)
- Newly added angle area to the specifications of each model.

2007.06.19: the issue of ver. 1.03

- Newly added commands.
  Zoom Direct with Focus (MD500 – 800 only)
- Change in required time from Wide end → Tele end

2007.11.01: the issue of ver.1.04

- Add new commands below:
  Pixel defect compensation command.
  Auto pixel defect compensation command at start-up.
- Revise Zoom Direct with Focus command.
- Add exclusive processing table.
- Add method of model distinguishing.
- Add Smart ATW description.
- Add info regarding time-period of accepting the commands after start-up.
- Add notices below:
  Pixel defect compensation function
  Auto pursuit function

Change history

Shifting to digital zoom area
Pan/Tilt Degree commands
Center BLC Area Direct commands
Privacy Mask related commands