Security Systems

Security Systems Division
www.pentax-security.com

PAIR
Pentax Atmospheric Interference Reduction

Varifocal **Plus**

HOMELAND SECURITY ZOOM LENSES

16X, 20X, 33X AND 55X (140X)

- Full HD Resolution 1080p

- **PAIR**-Technology

- Large Focal Range

- Megapixel

- High Speed Motors

- 1/2", C-Mount

- Iris Override

- Presets

- Compact and Robust

- Optimised for use in Ports, Border Patrol, Coastal Oil Fields, Highway Monitoring etc.

PENTAX
A RICOH COMPANY

16X ZOOM LENSES
2 Motors, Auto-Iris, High-Speed Motors

The 16x zoom lens has a focal length of 7.5 - 120 mm. Despite the increase in focal length over its predecessor, the optics are more compact meaning the overall length of the lens is now shorter. This also means a slight drop in weight, and all this while keeping the maximum aperture of F1.6.
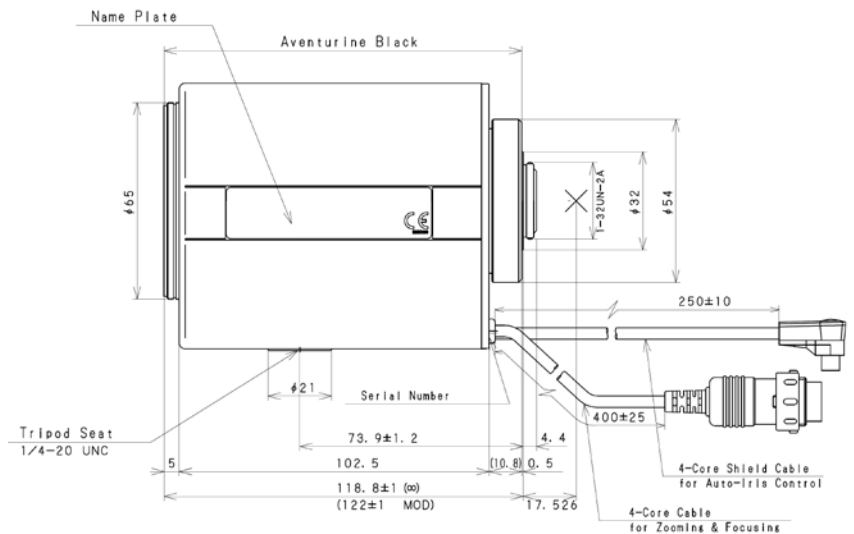
The build of the lens has been improved to allow for a faster focus motor without impacting on the lenses reliability or life span.

By using more advanced optical technology, the lens' overall performance has been increased including light transmission and resolution while reducing distortion and vignetting.

Functions/Characteristics:

- Compact Casing
- Maximum F-Stop
- High Speed Motors
- Enhanced Reliability

H16ZME-5F

Part No.	Designation	Format size	Mount	Focal length	Iris range	Iris control	M. O. D.	Horizontal angle of view	Filter size (mm)	Zoom (sec.)	Focus (sec.)
16x ZOOM LENSES, WITH 2 MOTORS, AUTO-IRIS, HIGH-SPEED-MOTORS											
C60726HK	H16ZMED-5 (HK)	1/2''	C	7.5 - 120mm	1.6 - 1000	DC	1.5m	45.8° - 3.1°	62	2.5	5.5
C60726WX	H16ZME-5 (WX)	1/2''	C	7.5 - 120mm	1.6 - 1000	VS	1.5m	45.8° - 3.1°	62	2.5	5.5
C60728HK	H16ZMED-5P (HK)	1/2''	C	7.5 - 120mm	1.6 - 1000	DC	1.5m	45.8° - 3.1°	62	2.5	5.5
C60728WX	H16ZME-5P (WX)	1/2''	C	7.5 - 120mm	1.6 - 1000	VS	1.5m	45.8° - 3.1°	62	2.5	5.5
C60727WP	H16ZME-5F (ST)	1/2''	C	7.5 - 120mm	1.6 - 1000	VS	1.5m	45.8° - 3.1°	62	2.5	5.5
C60727WX	H16ZME-5F (WX)	1/2''	C	7.5 - 120mm	1.6 - 1000	VS	1.5m	45.8° - 3.1°	62	2.5	5.5

20X ZOOM LENSES
Megapixel, High-Speed-Motors

The 20x is PENTAX RICOH's highest selling zoom lens. This series of zoom lens is now available with megapixel resolution.

Thus, it is not only matching the requirements of analogue cameras, but now also many high-resolution IP cameras.

Still available are the super high-speed zoom motors, which need just 2 seconds to cover the whole range of the zoom and/or the focus. All lenses have the high F-stop of F1.6.

H20ZAME-5P-M (WX)

H20ZAME-F-HD-PR02

Part No.	Designation	Format size	Mount	Focal length	Iris range	Iris control	M. O. D.	Horizontal angle of view	Filter size (mm)	Zoom (sec.)	Focus (sec.)
20x ZOOM LENSES, MEGAPIXEL, STANDARD OR HIGH-SPEED MOTORS											
C61237MHK	H20ZAMED-5-M (HK)	1/2''	C	12 - 240mm	1.6 - 720	DC	2.8m	30.8° - 1.6°	95	10	10
C61237MWX	H20ZAME-5-M (WX)	1/2''	C	12 - 240mm	1.6 - 720	VS	2.8m	30.8° - 1.6°	95	10	10
C61241MHK	H20ZAMED-5P-M (HK)	1/2''	C	12 - 240mm	1.6 - 720	DC	2.8m	30.8° - 1.6°	95	4.5	4.5
C61241MWQ	H20ZAME-5P-M (WQ)	1/2''	C	12 - 240mm	1.6 - 720	VS	2.8m	30.8° - 1.6°	95	4.5	10
C61241MWX	H20ZAME-5P-M (WX)	1/2''	C	12 - 240mm	1.6 - 720	VS	2.8m	30.8° - 1.6°	95	4.5	4.5
C61240MST	H20ZAME-5F-M (ST)	1/2''	C	12 - 240mm	1.6 - 720	VS	2.8m	30.8° - 1.6°	95	4.5	4.5
C61240MWQ	H20ZAME-5F-M (WQ)	1/2''	C	12 - 240mm	1.6 - 720	VS	2.8m	30.8° - 1.6°	95	4.5	10
C61240MWX	H20ZAME-5F-M (WX)	1/2''	C	12 - 240mm	1.6 - 720	VS	2.8m	30.8° - 1.6°	95	4.5	4.5
C61243MWQ	H20ZAME-5PK-M (WQ)	1/2''	C	12 - 240mm	1.6 - 720	VS	2.8m	30.8° - 1.6°	95	2	10
C61243MWX	H20ZAME-5PK-M (WX)	1/2''	C	12 - 240mm	1.6 - 720	VS	2.8m	30.8° - 1.6°	95	2	2
C61242MWQ	H20ZAME-5FK-M (WQ)	1/2''	C	12 - 240mm	1.6 - 720	VS	2.8m	30.8° - 1.6°	95	2	10
C61242MWX	H20ZAME-5FK-M (WX)	1/2''	C	12 - 240mm	1.6 - 720	VS	2.8m	30.8° - 1.6°	95	2	2
20x ZOOM LENSES, VGA AND FULL HD VIDEO, PAIR FUNCTION*											
C61249	**H20ZAME-F-PR01**	1/2''	C	12 - 240mm	1.6 - 720	VS	3.2m	30.8° - 1.6°	95	4.5	9
NEW	**H20ZAME-F-HD-PR02**	1/2''	C	12 - 240mm	1.6 - 720	VS	3.2m	30.8° - 1.6°	95	4.5	9

* See Feature comparison of H20ZAME-F-HD-PR02 to H55ZBME-F-HD-PR02 on page 6.

33X ZOOM LENSES
VGA Video and PAIR

The 33x zoom lenses are distinguished by their compact size and high F-Stop of F1.7 even though the focal range is long. Therefore, they keep the budget for a surveillance system low and make the installation easier.
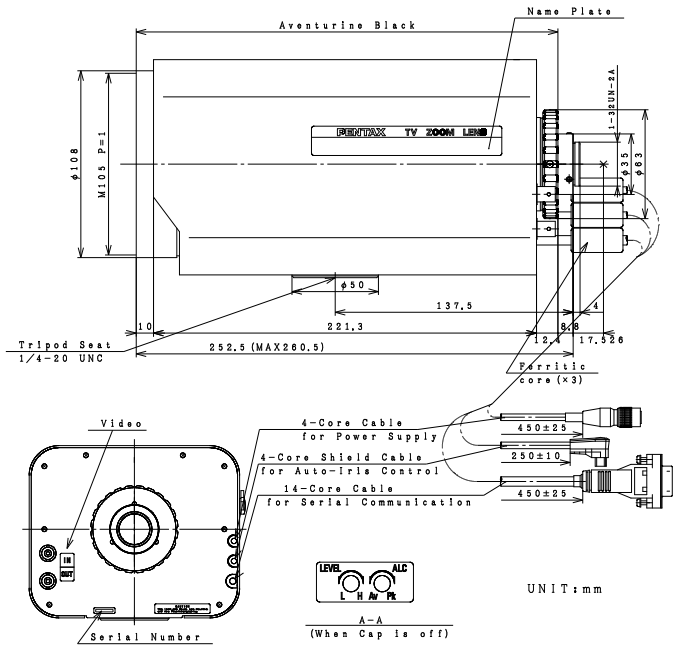
Like all other PENTAX RICOH CCTV lenses, this series of 33x zoom lenses are designed for use in professional surveillance systems in terms of quality and durability, so that the optical system meets the highest standards.

H33ZME-5P (WX)

Features of the H33ZME-P-PR01

PAIR-Specification	Reduces the effects of atmospheric interference, such as heat haze (uneven air density), fog/rain (liquid particles), sand/smoke/snow (solid), compounds etc.
Input/Output	Video Signal NTSC or PAL when input from the camera mounted on the lens, reduction of atmospheric interferences, output NTSC or PAL video signal, colour or B/W.
ON/OFF and Mode	Capable to switch PAIR function ON/OFF and to set Auto/Manual of PAIR function by respective 'Command'.
Auto PAIR Function	When the camera is used under environmental conditions with atmospheric interferences, the contrast of images within the 'AF' area of the centre of the screen is automatically corrected by the respective 'Command' for Auto PAIR function.
Manual PAIR Function	Capable to control the level from 0 to 255 of 'Contrast', 'Colour Density' and 'Tone' by inputting respective 'Command'.
User Setting Function	Capable to set and memorize up to 3 pattern of the above parameters 'Contrast', 'Colour Density' and 'Tone' by inputting respective 'Command'.
Operation controls	RS232
Autofocus	Capable to get the lens in focus 'on mouse click'
Dimensions/Weight	155mm (W)×138mm (H)× 355mm (L) / 5.8 kg

H33ZME-P-PR01

Technical Specifications

Part No.	Designation	Format size	Mount	Focal length	Iris range	Iris control	M. O. D.	Horizontal angle of view	Filter size (mm)	Zoom (sec.)	Focus (sec.)
33x ZOOM LENSES, WITH 2 MOTORS, AUTO-IRIS, HIGH-SPEED-MOTORS											
C61001WX	H33ZME-5P (WX)	1/2''	C	10 - 330mm	1.7 - 560	VS	2.9m	35° - 1.1°	105	3.5	6
33x ZOOM LENSES, WITH PAIR, 2 MOTORS, AUTO-IRIS, HIGH-SPEED-MOTORS											
C61000	H33ZME-P-PR01	1/2''	C	10 - 330mm	1.7 - 560	VS	3.4m	35° - 1.1°	105	3.8	9.8

55X (140X) ZOOM LENSES
Full HD Video plus a build-in 2.5x Extender

The 55x zoom lens is equipped with HD optics to offer maximum quality when used in conjunction with an HD camera.

When switching from VGA to Full HD mode, the 2 megapixel resolution (more than 4 times larger than standard video signal) allows the user to see far more detail and thus earlier identification of possible danger.

In combination with the built in 2.5x extender the extreme focal range covers all homeland security requirements.
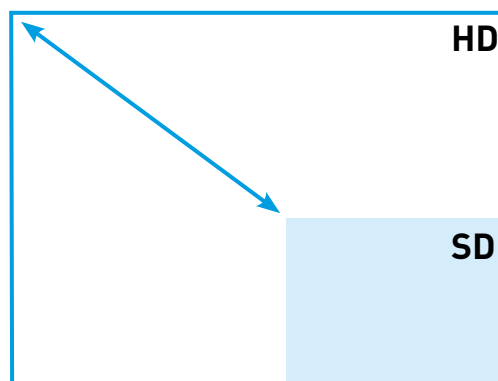
H55ZBME-5F-HD (ST)

Distance 15,000 m

Optical 55x Zoom

55x Zoom + 2.5x Extender

Feature Highlights

- Full HD Resolution 1080p
- 2 Megapixel
- Focal Length 12 - 1680 mm
- 140X Zoom with build-in 2.5X Extender
- Compact despite wide focal range
- High Quality HD Optics
- Highest Contrast
- Large Range of Features
- Presets
- Remote Iris Control
- For the latest generation of Analogue and Network Cameras

HD

SD

Part No.	Designation	Format size	Mount	Focal length	Iris range	Iris control	M. O. D.	Horizontal angle of view	Filter size (mm)	Zoom (sec.)	Focus (sec.)
ZOOM LENS 55x WITH HD RESOLUTION											
NEW **C61258ST**	H55ZBME-5F-HD (ST)	1/2''	C	12 - 660mm	4 - 360	VS	5m	31.7° - 0.6°	105	4.5	4.7
with 2.5x extender				30.5 - 1680mm	10 - 900			12.1° - 0.2°			

55X (140X) ZOOM LENSES PLUS PAIR
Image Stabilizer, Night Vision and more

Technical Specifications

	Part No.	Designation	Format size	Mount	Focal length	Iris range	Iris control	M. O. D.	Horizontal angle of view	Filter size (mm)	Zoom (sec.)	Focus (sec.)
NEW	C61256	H55ZBME-F-HD-PR02	1/2''	C	12 - 660mm	4 - 360	VS	7m	31.7° - 0.6°	105	4.5	4.7
	with 2.5x extender*				30.5 - 1680mm	10 - 900			12.1° - 0.2°			

* The extender needs 2 seconds to be activated/deactivated

H55ZBME-F-HD-PR02

H20ZAME-F-HD-PR02

Feature Comparison

Designation	H55ZBME-F-HD-PR02	H20ZAME-F-HD-PR02
Resolution	Full HD Resolution for Video on Highest Quality 1080p	HD Resolution for Video on Highest Quality 720p
PAIR-Specification	Reduces the effect of atmospheric interference, such as heat haze (uneven air density), fog/rain (liquid particles), sand/smoke/snow (solid), compounds etc.	
Input VGA Video	Output VGA (PAIR switchable on/off) NTSC or PAL when input from the camera mounted on the lens, reduction of atmospheric interferences, output NTSC or PAL video signal, colour or B/W.	
Input HD-SDI Video	Output HD-SDI (without PAIR) and VGA (PAIR switchable on/off)	
ON/OFF and Mode	Capable to switch PAIR function ON/OFF and to set Auto/Manual of PAIR function by respective 'Command'.	
Auto PAIR Function	When the camera is used under environmental conditions with atmospheric interferences, the contrast of images within the 'AF' area of the centre of the screen is automatically corrected by the respective 'Command' for Auto PAIR function.	
Manual PAIR Function	Capable to control the level from 0 to 255 of 'Contrast', 'Color Density' and 'Tone' by inputting respective 'Command'.	
User Setting Function	Capable to set and memorize up to 3 pattern of the above parameters 'Contrast', 'Color Densitiy' and 'Tone' by inputting respective 'Command'.	
Operation controls	RS232, RS422, RS485	
Image Stabilizer	Capable of stabilizing the Image based on video signal from a camera mounted on the lens.	
Iris	Switchable video/manual override and DC/manual override	
Autofocus	Capable to get the lens in focus 'on mouse click'	
Image Improvement	Night Vision Enhancement, Back Light Compensation	
C-Mount Boresight	Adjustable	
Dimensions/Weight	155mm (W)×138mm (H)× 355mm (L) / 5.8 kg	152mm (W)× 138mm (H)× 223,5mm (L) / 3.3 kg

Other models with less options are available

PAIR TECHNOLOGY

PAIR

Pentax Atmospheric Interference Reduction

The new **PAIR-Technology** reduces the affect of heat haze, which appears not only on hot sunny days, but also cold clear days or by the hot exhaust gases emitted by aircraft etc. Also PAIR reduces the effect of particles in the air, such as fog, rain, sand, smoke and snow.

The **integrated electronic image stabilizer** is particularly useful at telephoto, when even small movements of the lens or pan/tilt head or the effects of wind buffeted the mast will cause blur. The image stabilizer corrects the blur in `real time´ allowing monitoring even when other systems cannot provide useful images any more.

PAIR also offers **Backlight Compensation** and **Night Image Enhancement** as `add ons´ to the compensation functions of the camera.

The provided software allows remote control of lens functions, including zoom, focus, iris and operation of the **internal 2.5x Extender**.
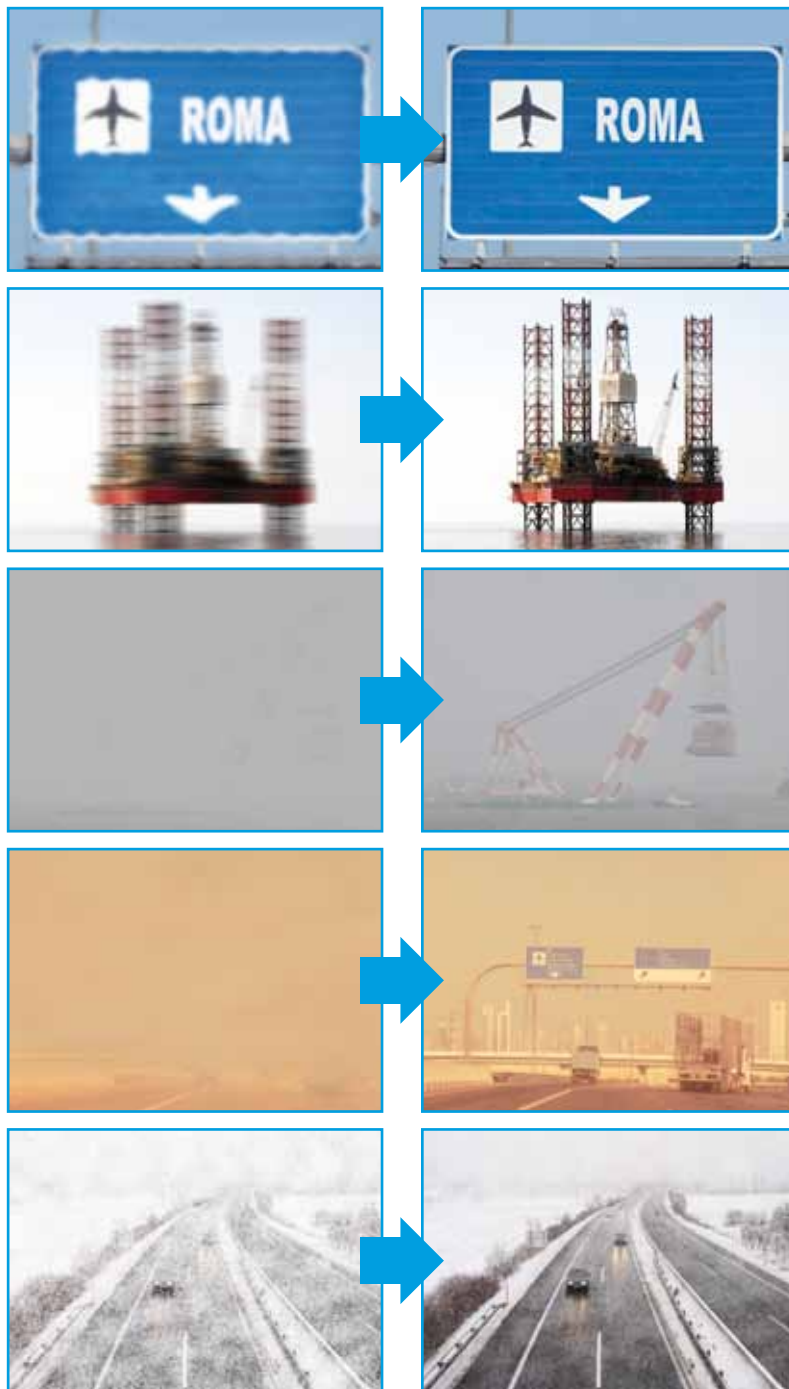
In addition, the software includes **reliable autofocus** with the click of a mouse – a useful advantage in the super-telephoto position, when depth of field is extremely low.

The lens is equipped with standard **RS232, RS422 & RS485 interfaces**. It comes with open platform control software and is compatible with standard CCTV colour cameras.
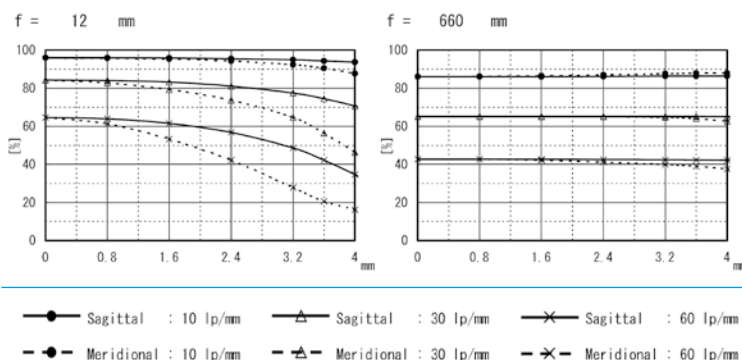
All functions are incorporated into the lens making installation and system integration as simply and cost effective as possible.

The **HD optics** in the lens offer significantly higher resolution over standard VGA lenses. HD Television offers twice the vertical and horizontal resolution on a corresponding monitor than conventional video surveillance. A second significant improvement is the color fidelity, and less color interferences compared with composite NTSC and PAL video.

Full HD Video (1080p) leads to a better and faster surveillance and inspection. In the case of an alert, the higher resolution will make the identification and evaluation of an event faster and easier. HD reduces the operator´s work and time and the number of potential false alarms.
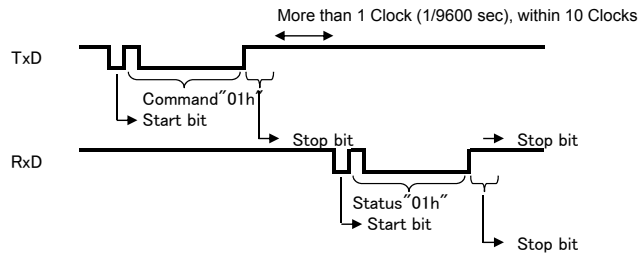
Optical Transfer Function (OTF)

f = 12 mm

f = 660 mm

- Sagittal : 10 lp/mm
- Sagittal : 30 lp/mm
- Sagittal : 60 lp/mm
- Meridional : 10 lp/mm
- Meridional : 30 lp/mm
- Meridional : 60 lp/mm

PAIR DATA COMMUNICATION

Depending on the PAIR Lens used, the communication can be handled through the RS232, RS422 or RS485 interface. Below you can find the corresponding example of the H55ZAME-F-PR02 using RS-232C with default settings (Normal H 1:H, 0:L, No parity, data length 8, stop bit 2, 9600bps top LSB).

- Control: command: 1-3 byte, status 1-2 byte
- ADC 10 bit
- Motor Voltage 8 bit (from lens circuit board 0V~DC12V)
- Supply Voltage for Control System (Connector C) DC12V 1A or less
- Setting values (motor voltage, backlash FRQ) will be memorised on the EEPROM. Memorised settings will be restored when the power is switched on again.

Pin Configuration

A (Lens Connector: D-Sub 9 Pin Female)

1	(DCD)	Data Carrier Detect
2	RxD	Received Data
3	TxD	Transmitted Data
4	(DTR)	Data Terminal Ready
5	GND	Ground
6	(DSR)	Data Set Ready
7	(RTS)	Request To Send
8	(CTS)	Clear To Send
9	(RI)	Ringing Indicator

B (Lens Connector: E4-191J-150)

1	Vcc	Supply Voltage3(DC8~15V)
2	–	
3	Video	Video Signal
4	GND	Ground

C (Lens Connector: HR10A-7R-4S)

1	Vc2	Supply Voltage 2(DC12V)
2	Vc1	Supply Voltage 1(DC12V)
3	GND1	Ground 1
4	GND2	Ground 2

COMMAND（CO）   PC (Controller) → Lens
STATUS（ST）   Lens→ PC (Controller)

1. Request Command		CO1	CO2	CO3	Command descriptions		ST1		ST2		ST3
Status Request	0x01	ST 1byte requested	None	None	Readout of lens condition.	0x01	Normal (incd. Definition of Ack)	None		None	
						0x81	Command error	None		None	
						0x82	Motor electric current error	None		None	
						0x84	Amp circuit current error	None		None	
Remote Iris Position Request	0x02	ST 1byte requested	None	None	Readout of zoom, extender motor voltage. 0~0xff	0x01	Normal (incd. Definition of Ack)	Ni	8 bit (0 – DC 5.5V)	None	
						0x8?	Error info excd. 81h	Ni	8 bit (0 – DC 5.5V)	None	
						0x81	Command error	None		None	
Zoom Position Request	0x03	ST 2 byte requested	None	None	Readout of zoom position. 0~0xffc0	0x01	Normal (incd. Definition of Ack)	Nz1	Zoom Position / top 8 bit	Nz2	bottom 2 bit XX000000b
						0x8?	Error info excd. 81h	Nz1	Zoom Position / top 8 bit	Nz2	bottom 2 bit XX000000b
						0x81	Command error	None		None	
Focus Position Request	0x04	ST 2 byte requested	None	None	Readout of focus position. 0~0xffc0	0x01	Normal (incd. Definition of Ack)	Nf1	Focus Position / top 8 bit	Nf2	bottom 2 bit XX000000b
						0x8?	Error info excd. 81h	Nf1	Focus Position / top 8 bit	Nf2	bottom 2 bit XX000000b
						0x81	Command error	None		None	

OUTLINE

(HK)	Auto-Iris, DC-controlled, 25cm cable, 4-pin plug
PAIR	PENTAX Atmospheric Interference Reduction
PR01	Reduction of Atmospheric Interferences caused by Particles in the Air, Autofocus with the Click of a Mouse, RS232C Interface
PR02	Function of PR01 plus Heat Haze Reduction and Integrated Electronic Image Stabilizer
(ST)	Auto-Iris, video-controlled, 25cm cable, 4-pin plug, manual override with D/A converter
(WQ)	Auto-Iris, video-controlled, 25cm cable, 4-pin plug, one high-speed or super high-speed zoom motor, standard focus speed
(WX)	Auto-Iris, video controlled, 25cm cable, 4-pin plug