

LS-AW LinkSprite Weather Proof
0.3 Mega pixel Serial RS232 Camera

Communication Protocol/ Data Sheet

Version B

LinkSprite Technologies, Inc

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The information in this manual was current when published. The manufacturer reserves the right to revise and improve its product. All specifications are therefore subject to change without any notice.

1. General Description

AW Serial Camera series has a standard RS232 interface; it supports RS232 input/output signals and can connect to PC or any other device with RS232 interface. The communication speed (baud rate) is 2400 bps, 9600bps, 14400 bps, 19200bps, 38400bps, 57600bps, and 115200pbs. It is default to 115200pbs.

2. Data Frame Type

There are three types of data frame transmitting between camera and host, they are: Command Frame, ACK/NAK Frame and Data Frame.

Structure of command frame:

Data Header "U" (1byte)	Command Byte (1byte)	Command Content (0—n bytes)	"#" (1byte)
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- Note:
1. The details of **command byte** advised in chart 1.
 2. The length of command content is subject to specific command byte.
 3. The command frame is used to set the working status of serial camera and start up snapshotting.

Structure of ACK/NAK frame

ACK

Data Header "U" (1byte)	Received Command Byte (1byte)	"#" (1byte)
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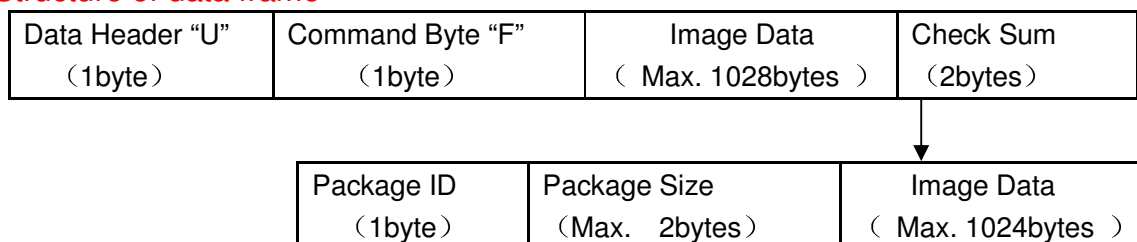
An ACK will be sent out by receiver after receiving expected (correct) commands frame.

NAK

Data Header "U" (1byte)	? (1byte)	"#" (1byte)
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A NAK will be sent out by receiver after receiving unexpected command or failing to process incoming command.

Structure of data frame



Note:

- (1) All data transmits from LSB;
- (2) All package size except the last one equals to the one set by snapshot command, the last one varies for different image.
- (3) Check sum equals to the sum of the whole package data except the check sum field(from U to the byte before check sum field)

3. Command Instruction

△Chart 1

Command Byte	Command Content	Description	Example
H	1Byte : Image(Picture) size 1: 160×128 pixel 2: 320×240 pixel 3: 640×480 pixel 2Bytes: package size (hexadecimal representation)	Host issues this command for requesting camera to snapshot a picture of specified size and divide it into packages according to directed size, and "UH #" responded by camera after receiving incoming command.)	UH 2 0x00 0x02 # Hexadecimal representation (55 48 32 00 02 23) Camera snapshots a picture with size 320x240 and divide it into packages according to the size of 512 bytes
R	2Bytes: Snapshot size (hexadecimal representation) 2Bytes: number of data packages (hexadecimal representation)	Camera issues this command to report the size of the snapshot and the number of data packages	UR 0x00 0x5C 0x2E 0x00 # Hexadecimal representation (55 58 00 5C 2E 00 23) "00 5C" these 2bytes represents snapshot size "2E 00" these 2bytes represents the number of data packages Camera reports the data size is 23K and the number of data packages is 46

<p>E</p>	<p>2bytes: package ID (hexadecimal representation)</p>	<p>Host issues this command to camera for getting the package with desired package ID</p>	<p>UE 0x2E 0x00 # Hexadecimal representation (55 45 2E 00 23)</p> <p>Get the package with package ID 46 from camera</p>
<p>F</p>	<p>2bytes: package ID (hexadecimal representation)</p> <p>2Bytes:Package Size (hexadecimal representation, without including the fields of package ID and check sum)</p> <p>n Bytes : Image Data</p> <p>2Byte: Check Sum (the sum of the whole package data except the check sum field)</p>	<p>Camera transmits the data of specified package to host</p>	<p>UF 0x2E 0x00 0x00 0x02Data Content..... 0x1E 0x13 Hexadecimal representation (55 46 2E 00 00 02+image data+check sum)</p> <p>Camera transmits the package with package ID 46, package size is 512 and check sum is 1E13.</p>
<p>I</p>	<p>Change the baud rate of camera</p> <p>1byte</p> <ol style="list-style-type: none"> 1. '0', 9600 2. '1' 19200 3. '2' 38400 4. '3' 57600 5. '4' 115200 6. '5' 2400 7. '6' 14400 	<p>Host issues this command to change the baud rate of camera, and an ACK will be sent out by camera after receiving incoming command.</p> <p>Camera keeps using this changed baud rate to connect host in the sequent communication process</p>	<p>UI '0' # Hexadecimal representation (55 49 30 23)</p> <p>Change the baud rate of camera to 9600, and camera responds "UI#" to host after receiving incoming command</p>

Notice: All letters are capitalized, and command can be represented as hexadecimal.

4. The length-byte of every command data frame

“H” command frame: 6bytes:

1byte ('U') +1byte ('H') +1byte (Image Size) +2byte (Package Size) + 1byte ('#');

“R” command frame receiving according to 7 bytes:

1byte('U') +1byte ('R') +2bytes (Image Size) + 2bytes(Number of package) +1byte('#');

“E” command frame: 5 bytes:

1byte ('U') +1byte ('E') +2bytes (Package ID) + 1byte ('#');

“F” command frame: 8+N bytes, “N” means the quantity of byte of image data

1byte ('U') +1byte('F') + 2bytes (package ID) + 2bytes (size of valid data in this package)

+ N bytes(content of image data in this package)

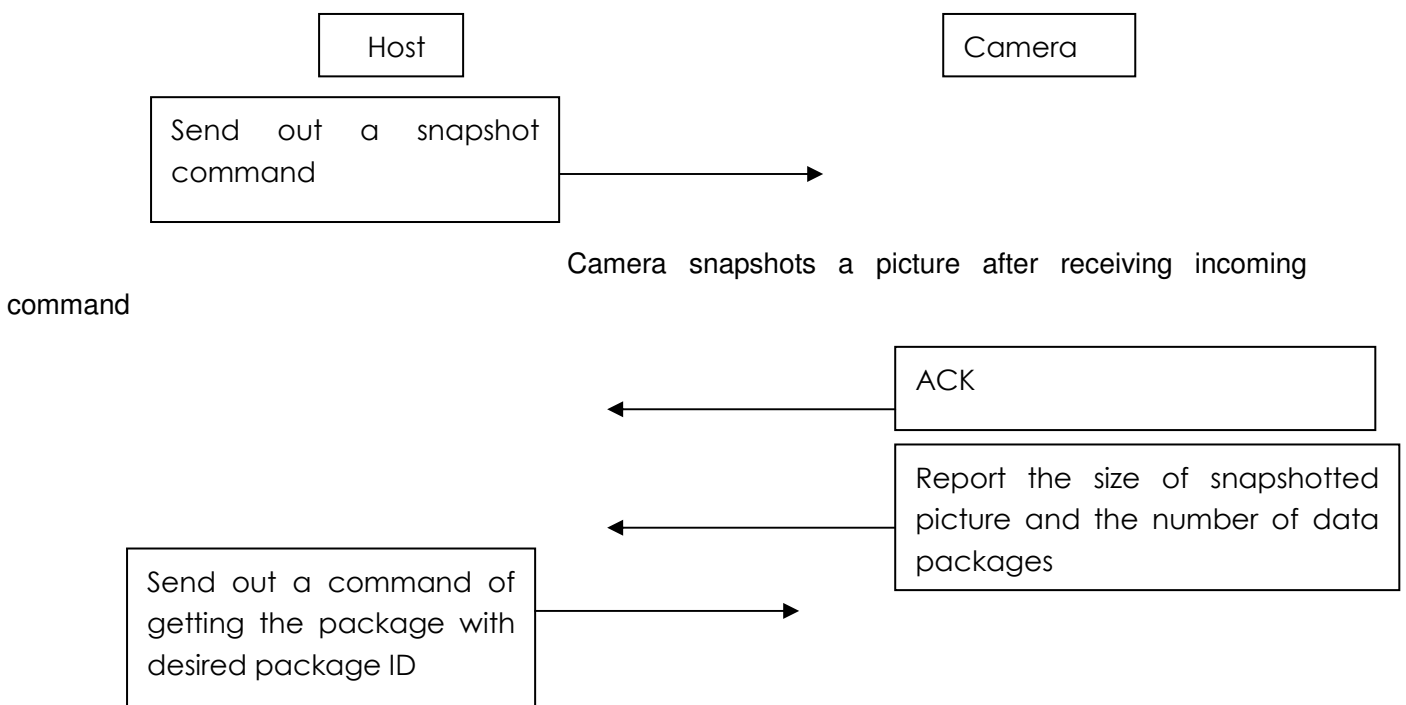
+ 2bytes (check sum field);

5. Interaction processing of protocol

1. The camera should be initialed after power on, and it takes about 2S to complete the initialization.

2. The consumed time of snapshotting: it takes T_p to snapshot a picture after camera receiving the snapshot command. The min. of T_p is 200ms is that when takes a white-black picture.

Snapshot a single picture (snapshot a picture of specified size)



ACK from camera:

UE # (55 45 23)

And then camera transmits the data of second package :

//UF the second package 520bytes

5546020000027475767778797A82838485868788898A92939495969798999AA2A3A4A5A6A7A8A9AA
B2B3B4B5B6B7B8B9BAC2C3C4C5C6C7C8C9CAD2D3D4D5D6D7D8D9DAE2E3E4E5E6E7E8E9EAF
2F3F4F5F6F7F8F9FAFFC0001108008000A003012200021101031101FFDA000C03010002110311003F
00E934E9231690CED1992793BE31C67078FA7F2AD6B70CB028906D6F4CD430C969112B16010013
807BF23F9D5A2096539E9DBD686F4B19A168A28A4329EA881EC1FD8823F3AE4EE5765C230E3A1
CFE35D8DE2EEB4917D4572B78A08FC3FAD6B4C3A0CD5154EB12EC5DB8C2E07183B40FE75DA5
7157EE1AF9A41DC293F5DA33FAD749A35CACFA7A26ECBC636B0F41938FD289AD0465B851E32D
CD8C6E03F1F2C549E27404DA7FC0FF00F65A86E7E5F150247FCB58C7FE3AB56BC46326D7FE05
FD28EA85D6E6ED14515914145145001451450067EB480E9539F61FCC566D94132F877308CB3B17
EA38C1F7FA569EB4C0695367BE00FCC553824F2BC2523E718864C7D7271557B442C72167034BA8
36D1911C65DBD8703FA8A76A134912208DB05B3938AB5A3286BAB894A6E0A00FBD8EA7FF00AD5
775482D255791A3C4D818393FFEAAABDDF40EA58D375059ED0DC344864023DC79F9B8C7D076ED
5D4D725E1CB6173A7C60270010D9E9F313FD2BAC1850173CE2A256B21585A28A2A464738DD0B0
AE4EEFA0FF76BB0EA2B9900F4 //check sum

.....
.....

Host sends out:

UE 0x06 0x00 # (55 45 06 00 23) // Request to get the data of the last package(the sixth package)

ACK from camera:

UE # (55 45 23)

And then camera transmits the data of the sixth package:

//UF the sixth package 116bytes

(the last package is not full of 512bytes, the actual size is 1801)

554606001801693484D20026909A696A4C93484422A1B9E262C380DC8A941A528B201B8E00AAB83
42DC6A97B79FEBEE1DC7A741F9557DCCDD4D5B48ADD4648DC7D2A749E341F2C23FEFAA134B6
1599452091FEEA1356134D9DFAA85AB1F6C973F290A3D00A63CAF21CBB1345C761DFD98B1F32C
C00F4C54A21B28C6465CFD0D57CD2E695D8EC59F3D02E16203F1A8CCAC7BFE951668CD21D87
E68CD33346EA007E69334C2D49BA8B8126EA6934DC93463345C2C05A93934E0B4F0940116DA509
52EDC518A0928034A0D301A5069B192034A0D301A5CD202406941A8F751BA8192E6973516EA506
90C97349BA9A3EB4A0501617752649A705A784A03423C5382D481453B02815C88253C2629F8A314
0AE3714B4B8A5E2810DC518A7710188 //Check Sum

All data transmits to host according to the above way.

6. FAQ:

Q: What is the power range of the camera module?

A: The range is +DC4.5V-5.5V.

Q: Is there any SDK available?

A: Yes, dedicated SDK can be supplied to customer.

LinkSprite Technologies, Inc.

Add: 1410 Cannon Mountain Dr, Longmont, CO 80503

Tel: 720-204-8599

Email: sales@linksprite.com

Technical questions: support@linksprite.com

Web: www.linksprite.com