# ARTCAM-2020UV-CL
# Camera Link Settings Manual
rev.1.05

# Contents

# 1. Introduction

This manual is for overall settings of cameras with Camera Link. Please refer to the camera instruction for more details of cameras.
This manual is especially for the following model:

**Table 1-1: Target Model**

| Model | Pixels | Frame Rate |
|---|---|---|
| ARTCAM-2020UV-CL | 4M | 23fps |

# 2. Device and System Requirements

To use a Camera Link camera, the following devices and software are required. Please have them prepared before starting the camera.

**Table 2-1: Minimum Requirements**

| Item | Note |
|---|---|
| Camera Link Frame Grabber Board | Compatible with Base Configuration |
| Viewer Software | Software accompanying with grabber board, or ArtMeasure |
| Serial Communication Software | e.g. Tera Term |
| PC | Any which can adopt items mentioned above. |
| Camera | |
| Camera Link Cable | The connector joining to camera should be SDR. |
| AC Adapter | Please use the AC adapter we offer |

All the settings in this manual are under the condition with following devices which we recommend. While using other devices, users could adapt settings correspondent to the devices.

**Table 2-2: Device and System recommended**

| Item | Recommendation |
|---|---|
| Camera Link Frame Grabber Board | PIXCI®EB1 (Manufactured by EPIX) |
| Viewer Software | XCAP for Windows Lite |
| Serial Communication Software | Tera Term |

# 3. Camera Link Format

## 3.1. Format

The following table shows the format of Camera Link compatible with this camera.

**Table 3-1: Format List**

| Configuration | Tap | Significant Bit | Color | Clock Frequency |
|---|---|---|---|---|
| Base | 12bit×2tap | 12bit (MSB Justified) | Grey Level | 85.000MHz |

Note: Since the pixel clock is 85Mhz, it may not work with a 10m cable.

## 3.2. Resolution

The following table shows the maximum pixels of this camera.

**Table 3-2: Resolution**

| Model | Horizontal Pixels | Vertical Pixels |
|---|---|---|
| ARTCAM-2020UV-CL | 2048 | 2048 |

# 4. Connector Pin Assignment

The connector pin assignment is as follows:

**Table 4-1: Connector Pin Assignment**

| Pin No. | Signal Name | Pin No. | Signal Name |
|---|---|---|---|
| 1 | GND | 14 | GND |
| 2 | X0- | 15 | X0+ |
| 3 | X1- | 16 | X1+ |
| 4 | X2- | 17 | X2+ |
| 5 | XCK- | 18 | XCK+ |
| 6 | X3- | 19 | X3+ |
| 7 | RX+ | 20 | RX- |
| 8 | TX- | 21 | TX+ |
| 9 | CC0- | 22 | CC0+ |
| 10 | CC1+ | 23 | CC1- |
| 11 | CC2- | 24 | CC2+ |
| 12 | CC3+ | 25 | CC3- |
| 13 | GND | 26 | GND |

# 5. Communication Specifications

### 5.1. About the settings of the product.

To change or check the settings of the Camera Link camera, you can send command to the camera through a serial communication software.

### 5.2. Communication Method

The serial communication method is as follows:

**Table 5-1: Communication Method**

| Item | Contents |
|---|---|
| Communication Form | Asynchronous serial communication<br>(In accordance with standards of RS232C) |
| Baud Rate | 9600bps |
| Data | 8 bit |
| Parity | None |
| Stop | 1 bit |
| Flow Control | None |

### 5.3. Command Format

Please give command to the camera through serial communication software with the format listed below. If the format is not correct, the camera could not be controlled.

Please be sure to use half-width characters of ASCII code.

**Table 5-2: Command Format**

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| **Format** | cmd | ☒ | -opt | ☒ | val | ⏎ (CR or LF or CR+LF) |
| **Details** | 1: One letter which represents the main purpose of the command.<br>2: One space (blank) as delimiter. (Omissible)<br>3: Option correspondent with the main purpose.<br>The format is a letter going after a "-".<br>4: One space (blank) as delimiter. (Omissible)<br>5: Value setting: enter the value if necessary.<br>Decimal numerical value: enter the number directly.<br>Hexadecimal numerical value: enter the number after an "x."<br>The default value would be 0 if there is no value entered.<br>6: Line feed code | | | | | |
| **Response** | Normal: OK⏎(CR+LF)<br>If response is a value: *"value"*⏎(CR+LF)<br>Abnormal: NG⏎(CR+LF) | | | | | |
| **Note** | The command will be distinguished once the line feed code is sent out.<br>If any none-half-width characters are typed (e.g. BackSpace) before line feed code, the response must be NG.<br>(If only line feed code is typed, there will be no reaction.)<br>If you want to cancel the command, type a none-half-width character before line feed code, the response will be NG.<br>It doesn't matter the letters of command is in upper case or lower case.<br>Option is omissible.<br>(In this case, a default option will be chosen automatically.) | | | | | |

### 5.4. List of Commands

The commands listed below shows controllable functions.
For more details of each commands, please refer to “5.5 Commands Details”

**Table 5-3: List of Commands**

| Function | cmd | -opt | val | Description |
|---|---|---|---|---|
| Shutter | i | -v | O | Shutter speed settings (Option is omissible) |

## 5.5. Commands Details

The details of each commands are as follows. Please refer to the command correspondent to your needs.

### 5.5.1. Shutter

**Table 5-4: Shutter Speed Settings**

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| **Format** | i | ☒ | -v | ☒ | val | ⏎ |
| **Details** | 1: i = Shutter<br>2: Delimiter (Omissible)<br>3: -v = Option: shutter speed settings (Omissible)<br>4: Delimiter (Omissible)<br>5: Value of shutter speed<br>6: Line feed code | | | | | |
| **Response** | Normal: OK⏎<br>Abnormal: NG⏎ | | | | | |
| **Note** | To set the shutter speed in trigger and preview modes.<br>※To calculate the shutter speed, please refer to the instruction of the camera. | | | | | |

# 6. Settings

## 6.1. Preparation

Before connecting camera to your PC, please install Camera Link frame grabber board, including driver and all the software necessary.
In some cases, it is required to register the license of the product, please complete the registration before starting using the camera.

After installing, please open device manager to check if the grabber board is recognized normally.
Make sure that the following two are recognized.:

**Table 6-1: Devices Recognized**

| No. | Device |
|---|---|
| 1 | PIXCI®EB1 PCI Express Camera Link Video Capture Board for Win XP/Vista/7/8/10-64bit |
| 2 | PIXCI® Camera Link Serial Port (COM3※1) |

※1: Will be different depending on systems.

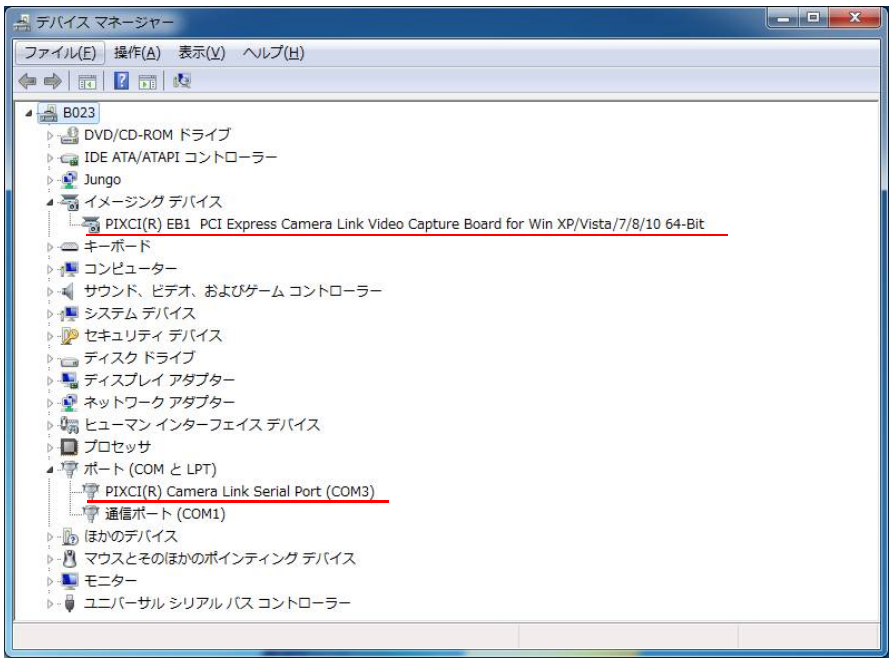


**Figure 6-1: Sample of device manager**

## 6.2. Connect to Camera

Please connect camera to the Camera Link frame grabber board with Camera Link cable.
Before connect AC adapter to the camera, please start up the serial communication software.
Command will be sent from the camera once it is connected to the power.

### 6.3. Example of Serial Communication Software Settings

Here we take “Tera Term” as the example of Serial Communication Software settings.
Please start up “Tera Term” before connecting AC adapter to the camera.


**Figure 6-2: Icon of Tera Term**

After starting the software, please choose the port correspondent with the name shown in device manager. (At the time this manual is made, it is shown as COM3.)

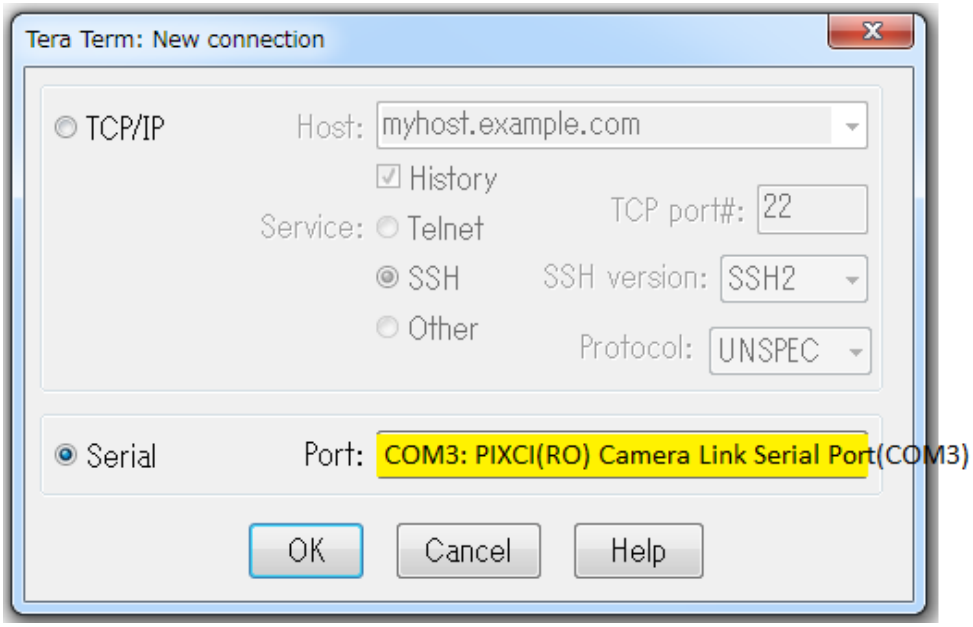


**Figure 6-3: To Choose Serial Port on Tera Term**

Please click “Setup” on menu bar, then choose “Serial Port” for communication method settings.
Please refer to **Table 5-1** Communication Method for details of the settings.

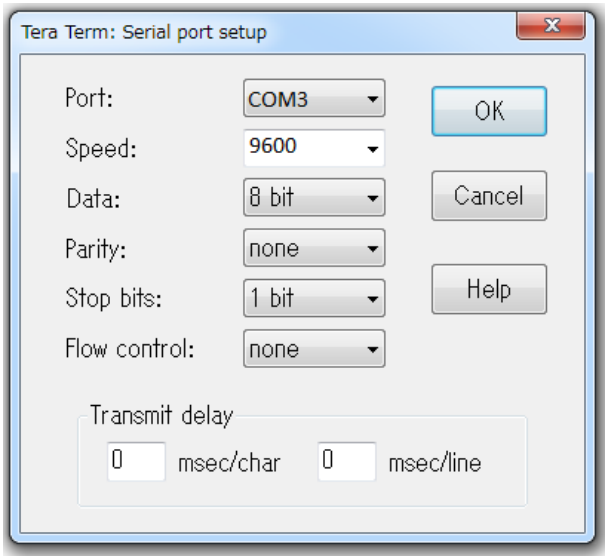


**Figure 6-4: To Set up Serial Port on Tera Term**

Please click “Setup” on menu bar, then choose “Terminal” for communication protocol settings.
The following table shows the recommended settings.
Please note that these settings are recommended for a smoother operation, but not necessary to be.

**Table 6-2: Communication Protocol**

| Item | Settings |
|---|---|
| New-line (Receive) | CR |
| New-line (Transmit) | CR+LF |
| Local echo | Check the box |

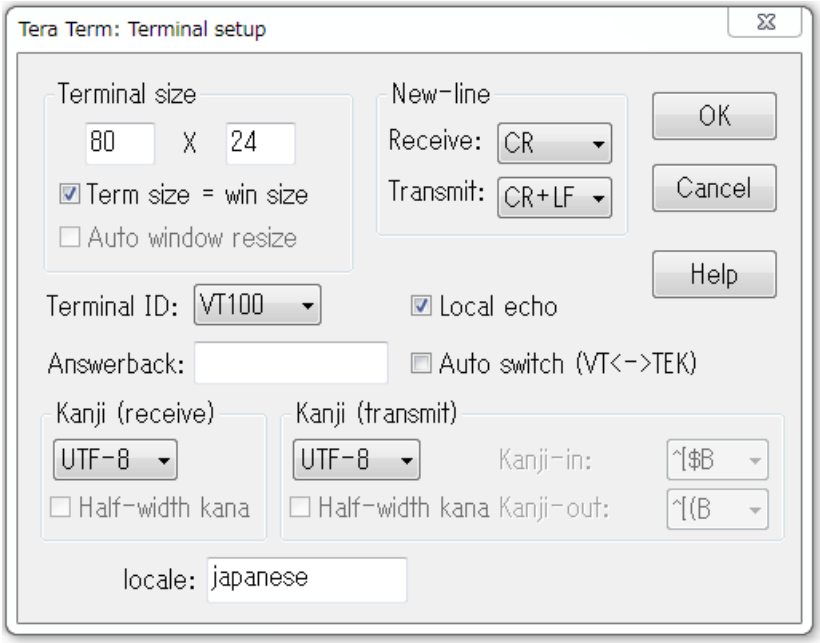


**Figure 6-5: To Set up Terminal on Tera Term**

After connecting camera with power, Tera Term will be initialized. Once the initialization is finished, you will see “OK” on the dialog box. Then you can send command to control camera. Please note that camera will start up only when you send out the command.

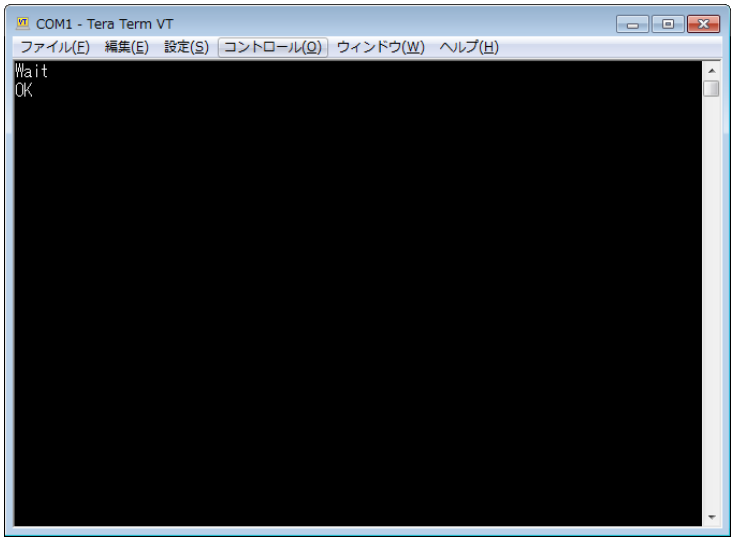


**Figure 6-6: Initialization**

### 6.4. Example of Viewer Software Settings

Here we take “EPIX®XCAP-LITE” as the example of viewer software settings.
Please start up “XCAP”.


**Figure 6-7: Icon of XCAP**

After starting up the software, you will see welcome message and license information. If you have already registered, please click OK directly.
If a warning or precaution concerning the license shows up, you may not complete the registration. In that case please register the license to continue.

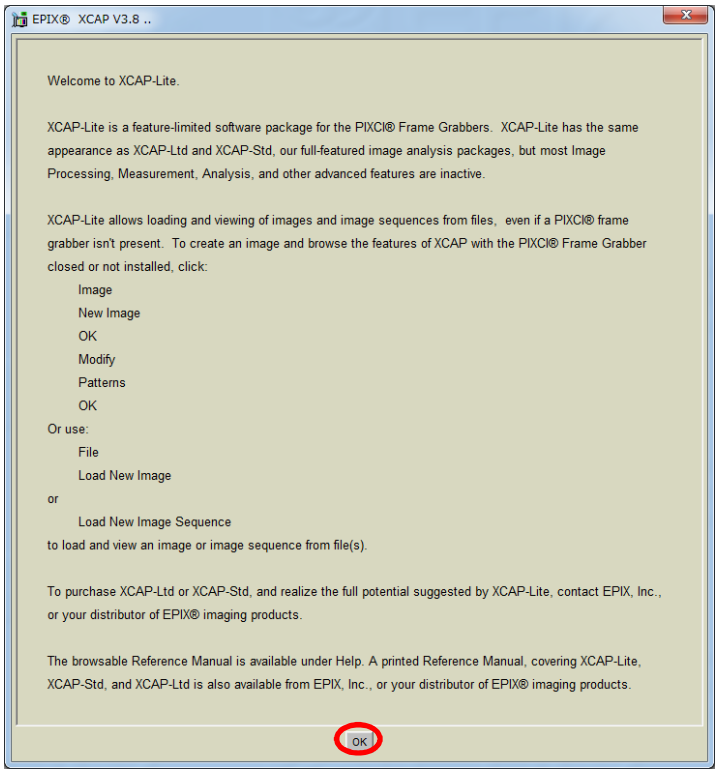


**Figure 6-8: Welcome message**

Please click “PIXCI®” from XCAP menu, then choose “PIXCI®Open/Close” to open the dialog box.
Please click “Open” to start the camera.

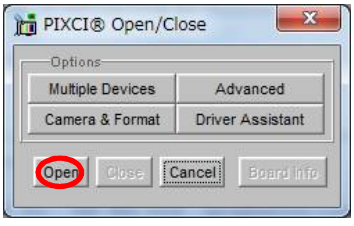


**Figure 6-9: To Open Camera**

After starting, you will see the settings of camera and display area.
First, please set communication settings: choose “Configure” to set Camera Link configuration, bit, tap and color.
Please refer to **Table 3-1** to confirm the Camera Link format.

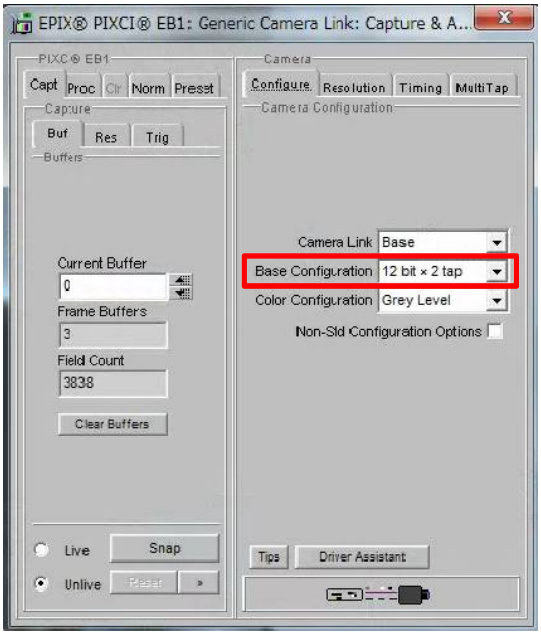


**Figure 6-10: Configure Settings**

Second, please set the resolution. Please refer to **Table 3-2** to confirm the resolution of each model.

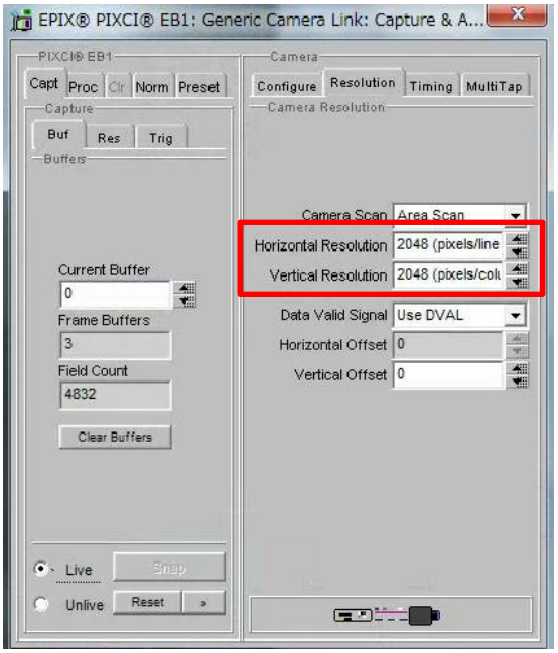


**Figure 6-11: Resolution Settings**

Third, please set clock frequency of Camera Link in “Timing.” Please refer to **Table 3-1** to confirm the Camera Link format.

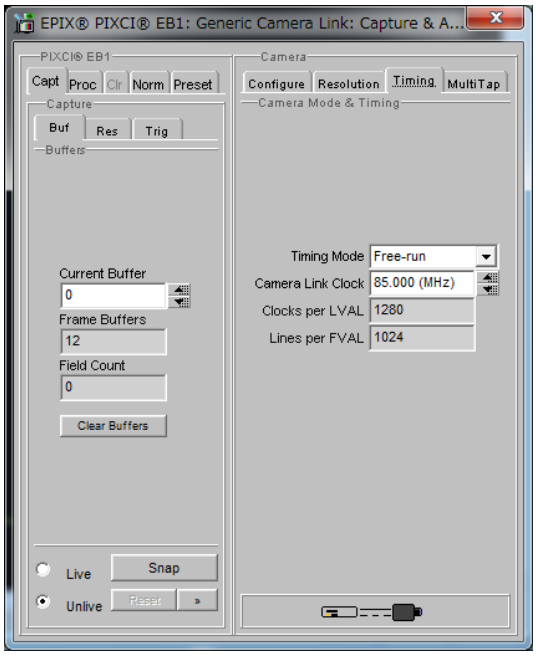


**Figure 6-12: Timing Settings**

The settings are finished now. The image will be displayed either by clicking “Live” in “Capture” on the sub-window, or simply by clicking “Live Icon” on the left side of the sub-window.

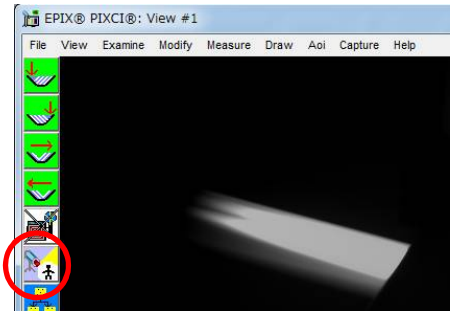


**Figure 6-13: Live Icon**