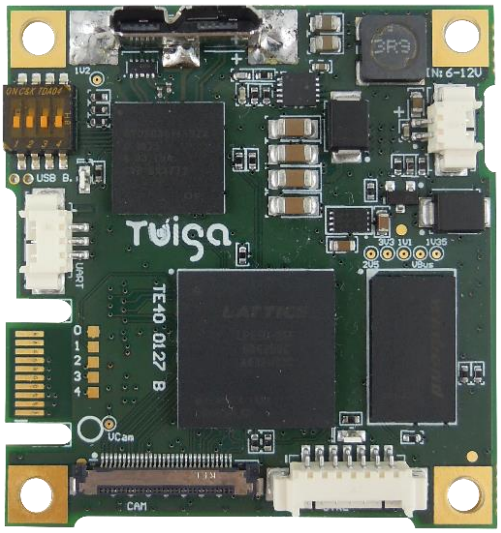
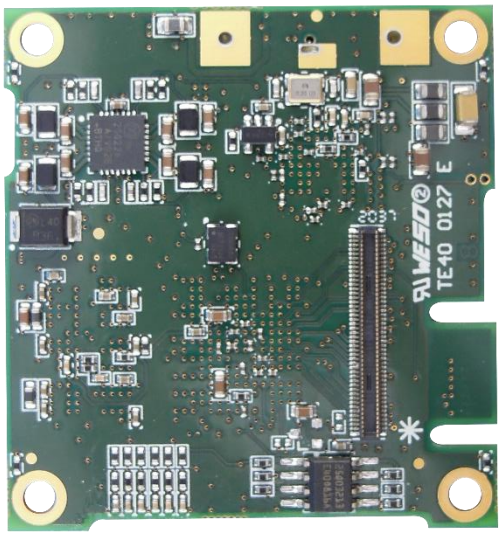
# Preliminary User Manual

# LVDS to USB3 video capture





**P/N – TV80 0097**: USB3.2 gen 1 Neo for LVDS camera blocks

***Includes:*** USB3 interface board (**P/N TV10 0083**), KEL 30 ways micro coaxial camera cable, 2 ways cable (power supply), 3 ways UART TTL cable, 7 ways cable (GPIOs), camera bracket, screws + spacers

**P/N – TV80 0097-L**: USB3.2 gen 1 Neo for LVDS camera blocks

***Includes:*** USB3 interface board (**P/N TV10 0083**), KEL 30 ways micro coaxial camera cable, 2 ways cable (power supply)

| | Writing | Approval |
|---|---|---|
| Date | 17/06/2020 | 24/06/2020 |
| Name | Cédric BOULANGER | Bryan Yon |
| Signature |  |  |

# Revision History

| Date | Revision | Description | Modified by | Note |
|---|---|---|---|---|
| **17/06/2020** | A | Creation of the document | CBO | |
| **26/10/2020** | B | Update power supply part and supported software | CBO | |

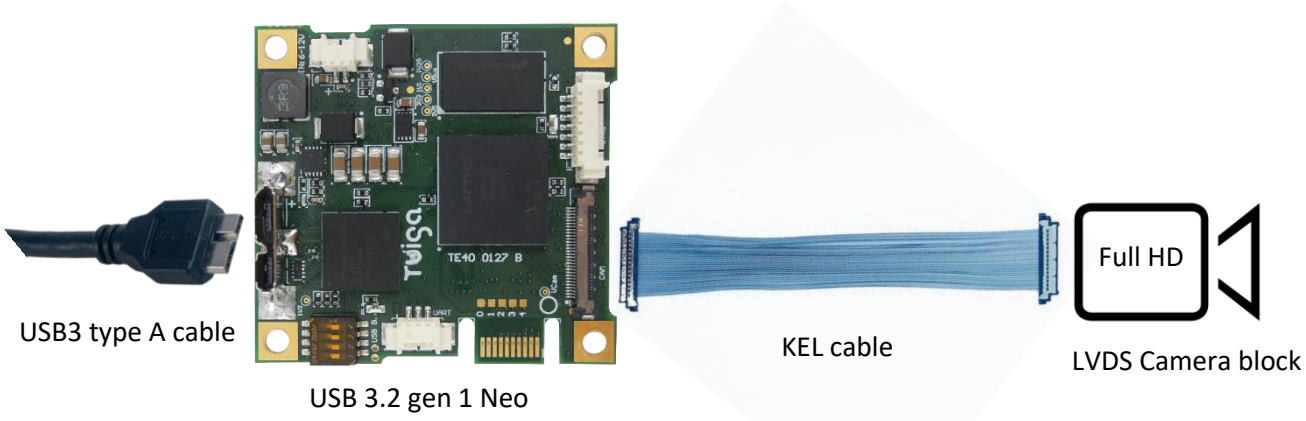
# Table of content

# 1. Connections

## 1.1. Global setup

Minimum requirements to connect a LVDS camera module to Twiga LVDS to USB3 module:

- LVDS Camera block
- Twiga USB 3.2 gen 1 Neo I/F board
- 30 ways KEL USL type micro coaxial cable
- USB3 cable
- (depending on the camera, a 2 ways cable for optional external power supply might be required)



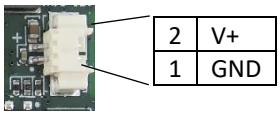

## 1.2. Power supply

There are two ways to power supply the board and camera:

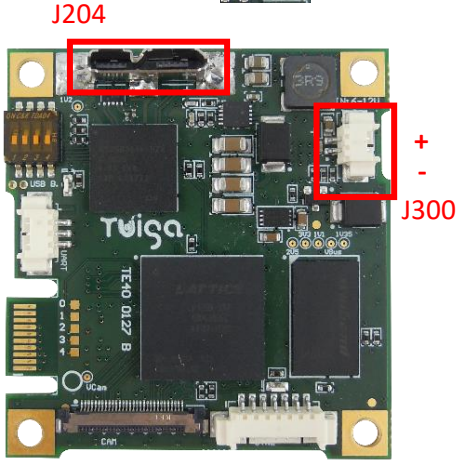
1. Full USB bus powered camera solution Via USB 3 cable

   **J204:** USB3 connector 

2. External camera power supply (6V-12V): it can be useful if the USB power (1A) is not enough. You could need this external power if you are using a laptop.

   **J300:** 2-way external power supply connector 

| | |
|---|---|
| 2 | V+ |
| 1 | GND |



# 2. Getting started

You can consult our support website to find all information about USB3 Neo: https://www.twiga-support.com/ Documentation, latest software, 3D file can be downloaded and a wiki will guide you through your first steps with the USB3 Neo. Feel free to contact us for further information.

## 2.1. Video stream

***OS support:***

- Windows 7 / Windows 8 / Windows 8.1 / Windows 10
- Linux (tested on Ubuntu 16.04)

***Using Windows:***

Several software are available to display the video:

- AMCap: in Devices select TWIGA USB3 NEO
- Yawcam: in Settings select TWIGA USB3 NEO
- VLC: in Media select “Open a capture device” and chose TWIGA USB3 NEO as Video device name

***Using Linux:***

The board is automatically detected as a device video in /dev/, to found it use “ls /dev/”. By default, the device is called video0. To display the stream, you can use a Gstreamer pipeline:

*gst-launch-1.0 v4l2src device=/dev/video0 ! autovideosink*

***Supported software:***

- VLC
- AMCap
- Yawcam
- Gstreamer
- OBS
- Debut from NCH Software
- Camera application on Windows

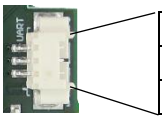
## 2.2. Communication

There are two ways to communicate with the camera:

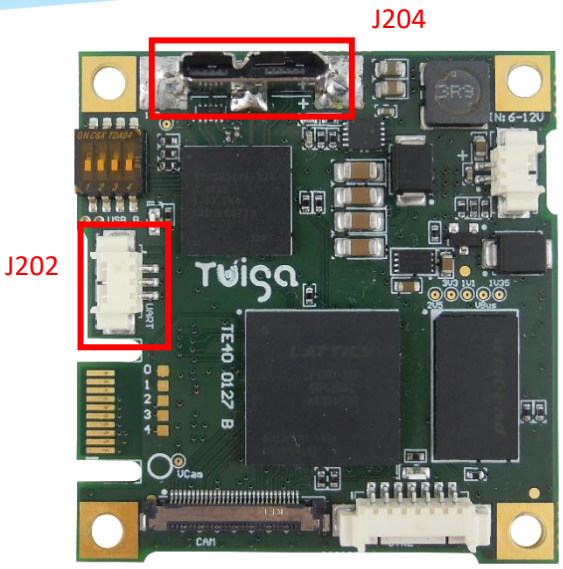
1. **CDC protocol**: it allows you to send commands (VISCA) to the camera through the USB3 cable. You can change video format, zoom, manage camera parameters such as focus, iris, shutter… You can use basic communication software (Termite) or specific software according to the camera block you use.

   **J204:** USB 3 connector 

2. **UART TTL**: you can also use the J202 connector to send VISCA commands to the camera.

   **J202:** 3 ways UART TTL connector 

| | |
|---|---|
| 3 | Tx |
| 2 | Rx |
| 1 | GND |




*Note:* These different communication ways have the same priority level.

***On Windows:***

The first time please refer to the driver installation procedure.
You can use Termite or putty to open the communication with the dedicated COM port and send VISCA commands.

***On Linux:***

The communication port is recognized on LINUX as a **/dev/ttyACMx** device, where ***x*** is the number of the device.

When a ***ttyACM*** device appears on Linux, some daemons software analyze it and it will not be available for 10sec. After that the device is released and the communication works as a COM Port on Windows.

You can use a serial communication terminal to send commands to the camera (e.g. **gtkterm**).

You can also use the "***echo***" command with a Linux terminal:

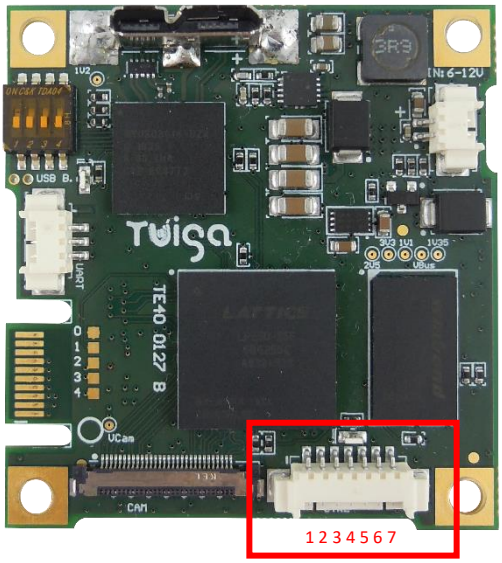
- Configure the tty with the correct baud rate: ***stty 9600 -F /dev/ttyACMx***
- For checking the configuration use: ***stty -a -F /dev/ttyACMx***
- Send commands like zoom plus as it ***echo –en '\x81\x01\x04\x07\x02\xff' > /dev/ttyACMx*** where ***x*** is the device number and ***8101040702FF*** the zoom in command in hexadecimal

## 2.3. GPIOs

For each GPIO corresponds a VISCA command to send to the camera.

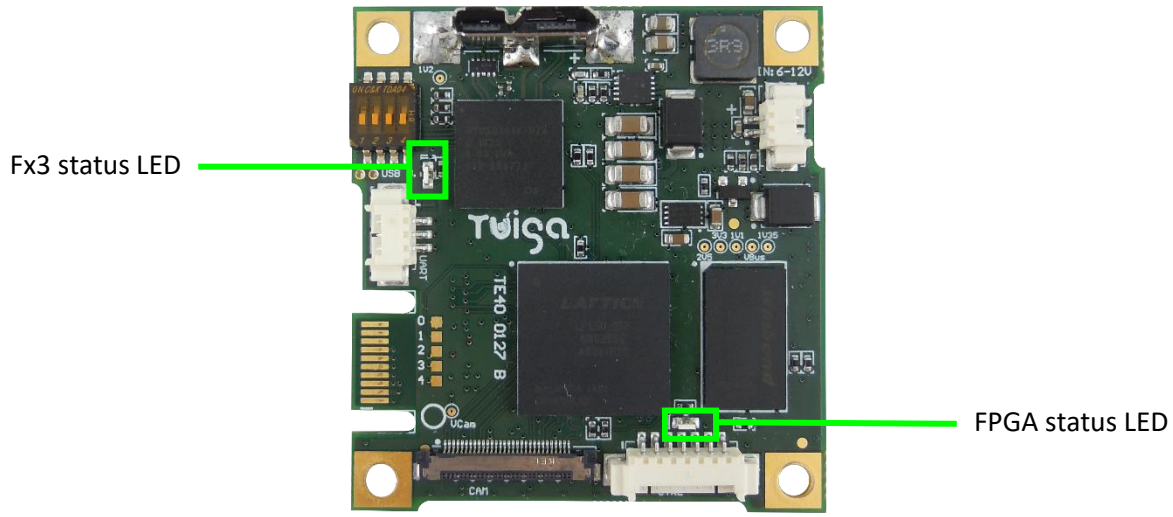
To active the GPIO you must connect it to GND.

| J200 pin out | Function |
|---|---|
| 1 | GND |
| 2 | Zoom + |
| 3 | Zoom - |
| 4 | Focus Auto/Manual |
| 5 | Focus Near |
| 6 | Focus Far |
| 7 | Freeze On/Off |




J200

## 2.4. LED signalization




| Number of Fx3 Status LED blink per 2 seconds | Meaning |
|---|---|
| 1 | Error |
| 2 | Video and communication error |
| 3 | Format and video error |
| 4 | Video error |
| 5 | Communication error |
| 6 | Configuration ok |

| Number of FPGA Status LED blink per 3 seconds | Meaning |
|---|---|
| 2 | Searching video format |
| 3 | Video format found |