# TL8651

**3G/HD-SDI Output Video Transceiver**

**CVBS output with MP1110M-VC**

**Thunder Link is a family of small form factor modules for formatting and converting generic digital video streams to standard compliant formats. Different interface standards are supported from the transmitter side including DVI/HDMI, 3G-SDI and HD-SDI. Supported physical media are copper and fibre cables.**

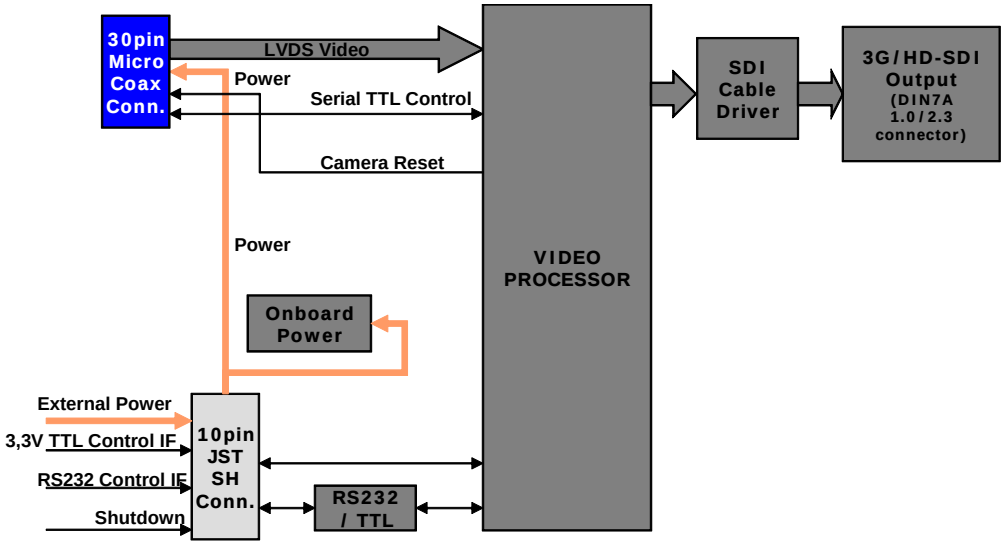
**These modules connect to the digital video interface of Tamron block cameras and support several progressive and interlace HDTV formats. TL8651 outputs serial digital video (SDI) up to 1080p60.**

## TL8651 Features

+ Supports Tamron MP1110M-VC ultra compact camera module
+ Supports Tamron MP1010M-VC ultra compact camera module
+ Digital 4channel LVDS video input from camera
+ 1080p output at 60Hz,59.94Hz,50Hz,30Hz,29.97Hz and 25Hz
+ 720p output at 60Hz,59.94Hz,50Hz,30Hz,29.97Hz and 25Hz
+ 1080i output at 60Hz,59.94Hz and 50Hz
+ Full automatic video input standard detection
+ 3G/HD-SDI output
+ SDI output compliant to SMPTE ST424M Level A and ST292M
+ Native digital signal processing chain for best image quality
+ CVBS loop out on dedicated connector (MP1110M-VC only)
+ RS232 and TTL level serial control interface
+ Supply voltage 12V DC regulated
+ Board Side Mount

**3G/HD-SDI Output 1080p60, 59.94 1080p50**

## Block Diagram TL8651




**Order Codes:**

**TL8651-D-RA**

Right angle DIN7A connector (-D-RA)

**Connector Options (MOQs apply)**

-D-ST Straight DIN7A
-H-ST Straight HDBNC
-H-RA Right angle HDBNC
-M-ST Straight MCX
-M-RA Right angle MCX

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## Specification Camera Interface

**INPUTS:**

| | |
|---|---|
| DATA | 4 CH. LVDS digital video (from camera) |
| CLOCK | LVDS (from camera) |
| CONTROL Rx | 3.3V TTL serial control interface |

**OUTPUTS:**

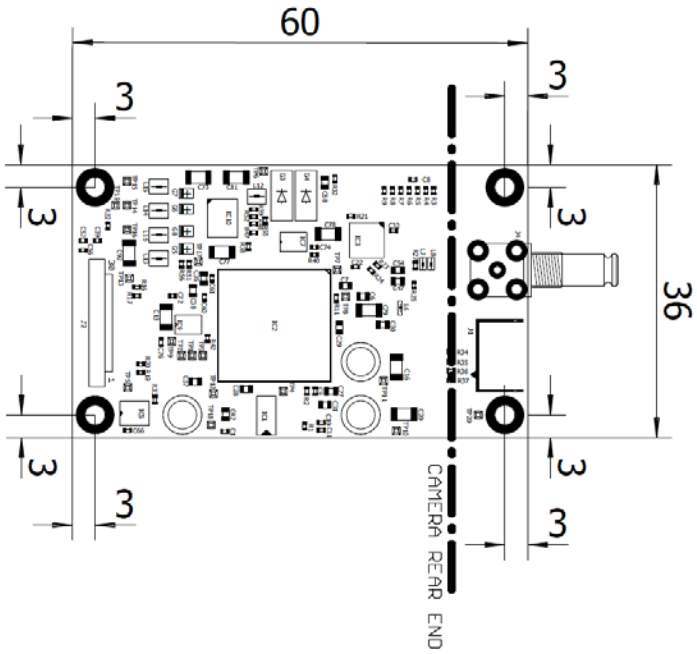
| | |
|---|---|
| CONTROL Tx | 3.3V TTL serial control interface |
| RESET | 3.3V TTL, active low |

## Power and Environment

**POWER INPUT:**
9.5V to 12V DC regulated (12.5V DC absolute maximum)
Power consumption (MP1110M-VC + TL8651) 4.7W (cam motors inactive)
Power consumption TL8651: 1.5W, 125mA @ 12V DC (typ.)
Power consumption value conditions:
Power 12V DC, video mode 1080p60
Ambient temperature +25°C/77°F
Humidity 30%

**OPERATING CONDITIONS:**
Ambient temperature (min/max): -5°C/+60°C = 23°F/140°F
Humidity: 20%-80%
**STORAGE CONDITIONS:**
Temperature (min/max): -20°C/+60°C = -4°F/140°F
Humidity: 20%-80%

## Board Mechanical




**All dimensions in mm.**

**Maximum top component height = 3.0mm (without coaxial connector)**

**Maximum bottom component height = 3.0mm**

**PCB thickness = 1.56mm**

**Outer mounting hole drill diameter 2.6mm**
**Outer mounting hole land diameter 5.2mm**

**SAFETY NOTES:**

All digital inputs are specified for maximum voltages of 3.3V (+5%).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# Pin Assignment of I/O Connectors

**J1 JST SM06B-SRSS-TB, do not connect**

**J2 KEL USL00-30L-A**

**Camera IF, use supplied 30wire micro coaxial cable only**

**J3 JST SM10B-SRSS-TB, Power and RS232/TTL Control IF**

1 DC IN
2 DC IN
3 GND
4 GND
5 Reset / Shut Down, pull to GND to reset/shut down TL7650 and camera*
6 GND
7 TXD_TTL (serial IF transmit, 3.3V) and/or temperature alert output
8 RXD_TTL (serial IF receive, 3.3V)
9 RXD_232 (serial IF receive, RS232 level)
10 TXD_232 (serial IF transmit, RS232 level)

*for reset, pull to GND for one second or longer

**Note: Connect RS232 or TTL serial interface, not both**

**J5 JST SM03B-SRSS-TB, CVBS output**

1 GND
2 CVBS analog video output
3 GND

**J4 75 ohms coaxial jack, 3G/HD-SDI output**

Default type: CEI C-SX113 (DIN7A / 1.0/2.3 coax system)

**Note on CVBS video output:**

CVBS analog video output is available with Tamron MP1110M-VC only. In this case the camera monitoring mode (register 72) must be set to NTSC or PAL video. Refer to Tamron MP1110M-VC technical manual for further details.

In NTSC or PAL mode, there will be no SDI output signal available from TL8651.

CVBS output connector J5 is available on Rev.B boards from September 26, 2018.

# Onboard Mode Switches

| Switch | OFF (default) | ON |
|---|---|---|
| | | |
| 1 - factory use | Keep OFF | -- |
| 2 - factory use | Keep OFF | -- |
| 3 - factory use | Keep OFF | -- |
| 4 - factory use | Keep OFF | -- |

**Table 1: Onboard Switch Functions**

**SAFETY NOTES:** All digital inputs are specified for maximum voltages of 3.3V (+5%).

**Internet:** www.aivion.com
**E-Mail:** sales@aivion.com



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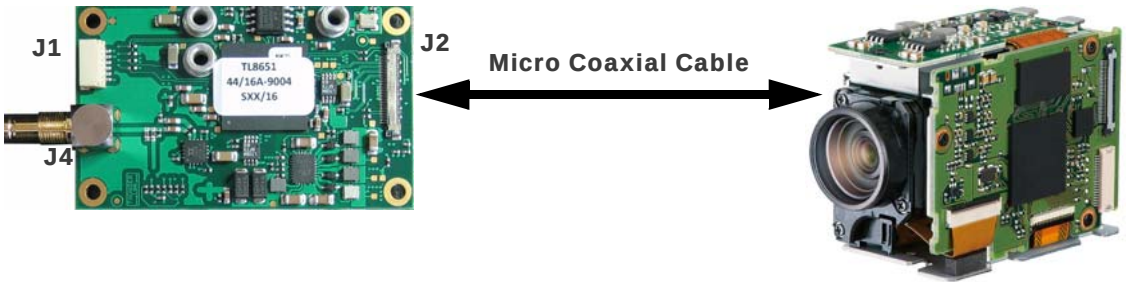
## Connection Diagram

**TL8651 top side**

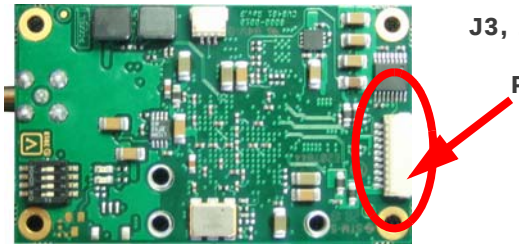
**MP1110M-VC or MP1010M-VC Camera**
(sold separately)




**TL8651 bottom side**

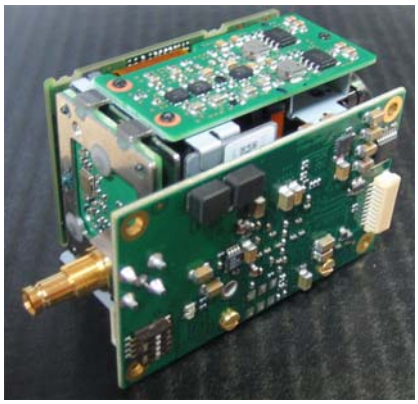
**J5, CVBS output (available with MP1110M-VC only)**

**J3, 12V DC Power input, Reset and RS232/TTL serial interface**

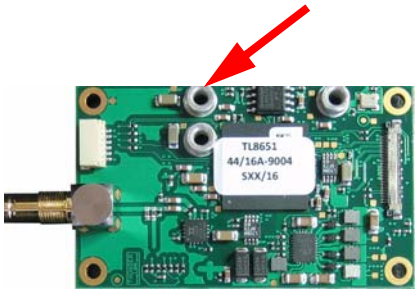



## TL8651 Side Mount on MP1110M-VC/MP1010M-VC Camera

TL8651 can be directly mounted on side of camera (fitting screws included). PCB has three metal spacers assembled.



**Metal spacer for side mount**




**SAFETY NOTES:** All digital inputs are specified for maximum voltages of 3.3V (+5%).

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## Reset Operation

When applying power to TL8651, the camera is also automatically powered. During power up all functions on the video transceiver board, are reset and initialized.

During operation a manual reset can be applied by pulling pin no. 5 of connector J1 to 0V (GND). This resets also the camera.

## Camera Control

Camera control can be done by connecting a PC or CCU via RS232 or serial 3.3V TTL interface to TL8651. The interface is passed through to the camera that all VISCA protocol based software can be used.

## Cable Kit Contents

**TLCK-B2 cable kit:**

**External connecting cables:**

1 pcs. - 10pin flying leads cable for power and control (RS232/TTL), lead length = 15cm / 5.9inch

1 pcs. - 3pin flying leads cable for CVBS video output, lead length = 15cm / 5.9inch

**Camera connecting cables:**

1 pcs. - 30pin KEL USL type micro coaxial cable, connector on both sides, length = 20cm / 7.8inch

**SAFETY NOTES:** All digital inputs are specified for maximum voltages of 3.3V (+5%).

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