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**Vision
Components**
The Smart Camera People

VC40XX Hardware manual

Hardware Specifications for VC40XX Cameras

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Foreword and Disclaimer

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References

Since the VC40XX smart camera family employs a TI processor the programming environment and functions for the VC20XX cameras can be used for this camera.

Please also consult the following resources for further reference:

| Type of resource | Name of file | Download location www.vision-comp.com |
|--------------------------------------|--|---|
| SW manual OS functions | VCRT5.pdf | Support->Reg. User Area->SW Manuals |
| SW manual Image Processing Functions | VCLIB_2_0.pdf VCLIB_300.pdf | Support->Reg. User Area->SW Manuals |
| Installation Manual | InstallVC20XX_VC40XX | Support->Customer Area->Getting Started VC20XX ... |
| Programming Tutorial Basic | Programming Tutorial for VC20XX and VC40XX Cameras | Support->Customer Area->Getting Started VC20XX ... |
| Demonstration Source code | Demo files VC20XX+VC40XX ... | Support->Customer Area->Demo Code |



The Light bulb highlights hints and ideas that may be helpful for a development.



This warning sign alerts of possible pitfalls to avoid. Please pay careful attention to sections marked with this sign.

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1 General Information



VC40XX Smart Camera series front view



VC40XX Smart Camera series rear view

The **VC40XX** is one of the fastest Smart Cameras on the market. From the outside the VC40XX series is identical with the VC20XX – the proven housing and Hirose connectors have remained unchanged.

However the internal electronics has been upgraded significantly.

The new TMS3200C64 processor from TI increases the computational power of the VC40XX almost three times (to 3200 MIPS, equivalent to a 2.6 GHz Intel Pentium) compared with the VC20XX camera family. In addition to that the VC40XX series features twice the internal memory (4Mbyte flash and 32 Mbyte RAM) and an SD card with 128 Mbyte replacing the MMC of the VC20XX.

Responding to customer demand, the VC40XX features both – 100 Mbit Ethernet and an additional V24 (RS232) Interface. The RS232 interface connects to the Trigger socket. For this reason the trigger input had to be slightly modified – existing trigger input circuits requires therefore adjustment. Please refer to section 4.2 for details. All other interfaces have remained unchanged.

Like the VC20XX series the high speed trigger input of the VC40XX family allows jitter free taking – even when inspecting fast moving objects. As the previous generation the VC40XX camera also includes 24 V digital IO's and a direct video output.

Like with all VC Smart Cameras with Texas Instruments DSP, the operation system VCRT allows multi- tasking. This means for instance that user interface commands can execute in parallel without stopping the inspection process. It is also possible to transfer live images via TCP/IP using a background task.

Image acquisition can be done in the camera background. The VC20XX and VC40XX allow to perform the three tasks of image capture, image transfer and image processing in parallel, greatly increasing the amount of processed images per second.

The VC40XX family will be extended to match the feature variety of the VC20XX series in order to offer the right camera for your application.

2 Basic Structure

The image is formed by a high-resolution progressive scan CCD sensor. One channel of video input is digitized.

The VCSBC40XX has a direct video output.

The TMS320C64 DSP is one of the fastest 32bit DSPs. It features a RISC-like instruction set, up to 8 instructions can be executed in parallel, two L1 cache memories (16 Kbytes each) and a 128 Kbytes L2 cache on chip. Its high speed 64-channel DMA controller gives additional performance. The DSP uses fast external SDRAM as main memory. A flash EPROM provides non-volatile memory.

[See Appendix A: Blockdiagram VC40XX Cameras](#)

3 Technical Specifications VC40XX

3.1 Technical Specifications VC4038

| | |
|-----------------------|--|
| Sensor: | 1/3 " SONY ICX424AL |
| eff. no. of pixels: | 640(H) x 480(V) |
| Pixel size: | 7.4 μm (H) x 7.4 μm (V) |
| Chip size: | 5.79mm (H) x 4.89mm (V) |
| Integration: | full-frame |
| Picture taking: | program-controlled or triggered externally; full-frame / 63 frames per second |
| Binning | 2 times binning, 126 frames/s, 640(H) x 240(V) |
| Shutter | 5 μs , 10 μs , 15 μs , 19 μs , ... + steps of 31 up to 20s |
| Clamping: | zero offset digital clamping |
| A/D conversion: | 1 x 25 MHz / 10 bit |
| Input LUT | 1024x8 bit (10bit \rightarrow 8 bit) |
| Image display: | black-and-white, Pseudo Color from color lookup table 3x8Bit RGB, live image, still image, graphics |
| Overlay: | 8-bit overlay with LUT, maskable |
| Processor: | Texas Instruments TMS320 C64 signal processor 400 MHz |
| RAM: | 32 MByte |
| Flash EPROM: | 4 MByte |
| SD card | 128 MByte (initially formatted to 16Mbyte) |
| Process interface: | 4 inputs / 4 outputs, optically decoupled 24 V, outputs 4x500 mA |
| Trigger input: | Fast 3-5 V TTL input and output. |
| Ethernet interface: | 100Mbit Ethernet |
| Serial Interface: | 115,200 bd serial RS232 communication port |
| Video output: | RGB, 3x75 Ohm, 1 Vpp, SVGA output, HSYNC, VSYNC separate |
| Horizontal frequency: | 48.08 (VESA standard) |
| Vertical frequency: | 72.19 (VESA standard) |
| Resolution SVGA: | 800x600 (VESA standard) |
| Pixel frequency: | 50.0 MHz (VESA standard) |

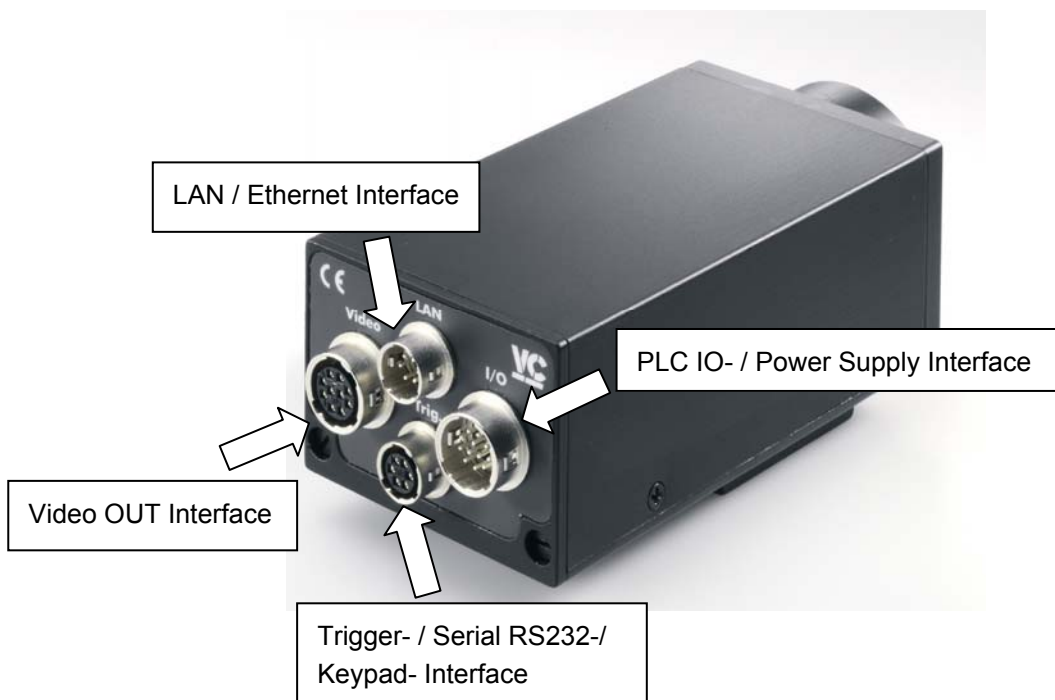
3.2 Technical Specifications VC4065

| | |
|-----------------------|---|
| Sensor: | 1/2" SONY ICX415AL |
| eff. no. of pixels: | 782(H) x 582(V) |
| Pixel size: | 8.3(H) x 8.3(V) μm |
| Chip size: | 7.48(H) x 6.15(V) mm |
| Integration: | full-frame progressive scan |
| Picture taking: | program-controlled or triggered externally; full-frame / 55 frames per second |
| Binning | 2 times binning, 110 frames / s, 782(H) x 291(V) |
| Shutter | 5 μs , 10 μs , 15 μs , ... + steps of 30.5 up to 20s |
| Clamping: | zero offset digital clamping |
| A/D conversion: | 1 x 33 MHz / 10 bit |
| Input LUT | 1024x8 bit (10bit \rightarrow 8 bit) |
| Image display: | black-and-white, Pseudo Color from color lookup table 3x8 Bit RGB, live image, still image, graphics |
| Overlay: | 8-bit overlay with LUT, maskable |
| Processor: | Texas Instruments TMS320 C64xx signal processor 400 MHz |
| RAM: | 32 MByte |
| Flash EPROM: | 4 MByte |
| SD card | 128 MByte (initially formatted to 16Mbyte) |
| Process interface: | 4 inputs / 4 outputs, optically decoupled 24 V, outputs 4x500 mA |
| Trigger input: | Fast 3-5 V TTL input and output. |
| Ethernet interface: | 100 Mbit Ethernet |
| Serial Interface: | 115,200 bd serial RS232 communication port |
| Video output: | RGB, 3x75 Ohm, 1 Vpp, SVGA output, HSYNC, VSYNC separate |
| Horizontal frequency: | 48.08 (VESA standard) |
| Vertical frequency: | 72.19 (VESA standard) |
| Resolution SVGA: | 800x600 (VESA standard) |
| Pixel frequency: | 50.0 MHz (VESA standard) |

3.3 Technical Specifications VC4066

| | |
|-----------------------|---|
| Sensor: | 1/3" SONY ICX204AL |
| eff. no. of pixels: | 1024(H) x 768(V) |
| Pixel size: | 4.65(H) x 4.65(V) μm |
| Chip size: | 5.8(H) x 4.92(V) mm |
| Integration: | full-frame progressive scan |
| Picture taking: | program-controlled or triggered externally; full-frame / 30 frames per second |
| Binning | 2 times binning, 60 frames/s, 1024(H) x 384(V) |
| Shutter | 10 μs , 15 μs , 20 μs , ...+ steps of 42.3 up to 20s |
| Clamping: | zero offset digital clamping |
| A/D conversion: | 1 x 33 MHz / 10 bit |
| Input LUT | 1024x8 bit (10bit \rightarrow 8 bit) |
| Image display: | black-and-white, Pseudo Color from color lookup table 3x8 Bit RGB, live image, still image, graphics |
| Overlay: | 8-bit overlay with LUT, maskable |
| Processor: | Texas Instruments TMS320 C64xx signal processor 400 MHz |
| RAM: | 32 MByte |
| Flash EPROM: | 4 MByte |
| SD card | 128 MByte (initially formatted to 16Mbyte) |
| Process interface: | 4 inputs / 4 outputs, optically decoupled 24 V, outputs 4x500 mA |
| Trigger input: | Fast 3-5 V TTL input and output. |
| Ethernet interface: | 100Mbit Ethernet |
| Serial Interface: | 115,200 bd serial RS232 communication port |
| Video output: | RGB, 3x75 Ohm, 1 Vpp, SXGA output, HSYNC, VSYNC separate |
| Horizontal frequency: | 63.98 kHz (VESA standard) |
| Vertical frequency: | 60.02 kHz (VESA standard) |
| Resolution SVGA: | 1280 x 1024 (VESA standard) |
| Pixel frequency: | 108 MHz (VESA standard) |

4 VC40XX Camera Interfaces



The VC40XX Smart Camera incorporates the following connector interfaces:

1. LAN / Ethernet Interface
2. Trigger- Serial V24 (RS232)- and Keypad Interface
3. PLC IO and Power Supply Interface
4. Video Output Interface

The pin assignments, electrical specifications as well as available accessories are shown for each interface connector in the following sections.

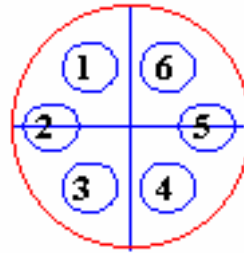
Please also refer to the [Product/Hardware/ Order Numbers for VC40XX Accessories/Cables page](#) for an up to date list of cables and further information available.

4.1 LAN / Ethernet Interface

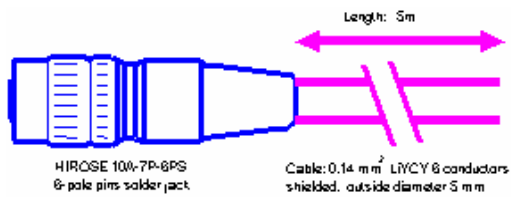
4.1.1 Pin Assignments LAN / Ethernet Interface

| Signal | Pin |
|--------|-----|
| T+ | 2 |
| T- | 1 |
| R+ | 6 |
| R- | 5 |
| - | 3 |
| - | 4 |

rear view camera socket:



4.1.2 Available Accessories for LAN / Ethernet socket



| Signal | Pin (to cam.) | Pin (to PC) | Cable Color 20m patch cable | Cable Color 10m patch cable |
|--------|---------------|-------------|--------------------------------|--------------------------------|
| T+ | 2 | 1 | yellow | white/pink |
| T- | 1 | 2 | orange | pink |
| R+ | 6 | 3 | white/green | white/green |
| R- | 5 | 6 | green | green |
| - | 3 | NC | - | - |
| - | 4 | NC | - | - |

Refer to section 5 for a list of available cables with order numbers.

4.2 Trigger-/ V24 (RS232)-/ Keypad Interface

The trigger interface now also incorporates a V24 (RS232) interface. For this reason there are 2 different cables:

- Trigger Cable (without second connector)
- Serial Cable (with D-sub connector on the other end)

There also is a new keypad available that connects to this Trigger / Serial interface.

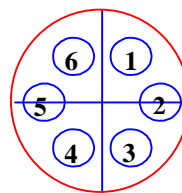
The color coding for each core has been maintained from the VC20XX smart camera family.

Trigger and serial interface or trigger and keypad can be connected at the same time using the following Y-cable:

4.2.1 Pin Assignments Trigger-/ V24 (RS232)-/ Keypad Interface

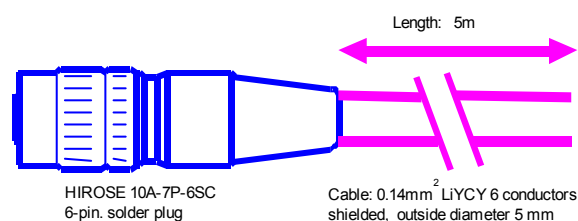
| Pin | Signal |
|-----|-------------|
| 1 | V24 TxD Out |
| 2 | + 5V Out |
| 3 | GND |
| 4 | V24 RxD In |
| 5 | Trigger Out |
| 6 | Trigger In |

rear view camera socket:



Compared with the VC20XX Trigger interface, the former “Trigin –“ Interface has been replaced with a “V24 TxD Out” signal allowing the use of a bidirectional serial RS232 Interface (refer to section 6 for programming details). This means when replacing a VC20XX camera with a VC40XX the trigger input circuit needs to be modified, or the camera can be damaged! See the Electrical specifications in section 4.2.5 for details.

4.2.2 Trigger Cable



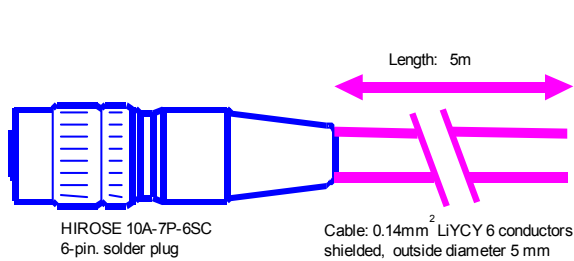
| Pin | Signal | Cable Color ¹ |
|-----|-------------|--------------------------|
| 1 | V24 TxD Out | green |
| 2 | + 5V Out | brown |
| 3 | GND | white |
| 4 | V24 RxD In | pink |
| 5 | Trigger Out | grey |
| 6 | Trigger In | yellow |

Equipped on one end with a Hirose plug, length 5m, 10m or 25m

Refer to section 5 for a list of available cables with order numbers.

¹ Note that the color coding for both cables has been chosen according to the VC20XX core colors. For this reason the core colors of serial and trigger cables do not correspond to the same pin!

4.2.3 V24 (RS232) serial Cable



| Pin | Signal | Cable Color |
|-----|-------------|-------------|
| 1 | V24 TxD Out | brown |
| 2 | + 5V Out | pink |
| 3 | GND | grey |
| 4 | V24 RxD In | white |
| 5 | Trigger Out | NC |
| 6 | Trigger In | NC |

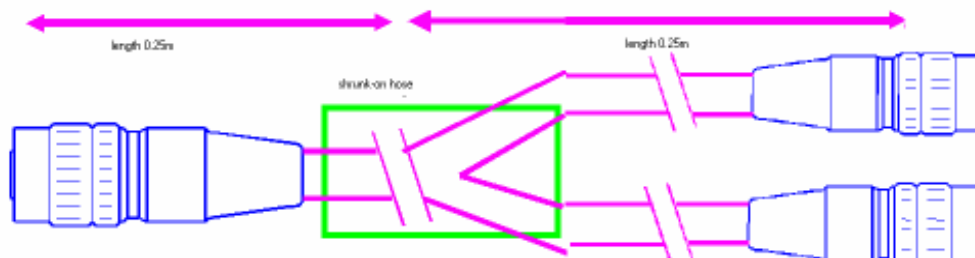
Equipped on one end with a Hirose plug, length 5m, 10m or 25m and on the other end with a 9 pin D-sub connector. This cable can also be ordered without the D-sub connector.

Refer to section 5 for a list of available cables with order numbers.



Refer to section 6.1 for information on programming the serial interface.

4.2.4 Y-Cable



Connectors:

1x HR10A-7P-6P, male connector

2x HR10A-7J-6S, female socket

Cable length: 0.5m

The color coding of this cable corresponds to the Trigger Cable described above.

Refer to section 5 for a list of available cables with order numbers.

4.2.5 Electrical Specifications of Trigger- / Serial- / Keypad Interface

The board features a dedicated fast TTL trigger input (for use as image capture trigger) and a fast TTL trigger output (as strobe-light trigger). Since both signals are fast at a very low noise margin, it is recommended to keep the cable as short as possible. Use shielded cable for this purpose.



Neither the trigger input nor the trigger output has an inbuilt-in photo coupler. Please ensure that the electrical specifications of this section are met and provide galvanic isolation to trigger input and output if necessary.

Please note that input and output are not protected against over current. The output is neither protected against short circuit nor reverse voltage spikes from inductive loads.

The trigger input assures constant delay without jitter.

Technical data of trigger input:

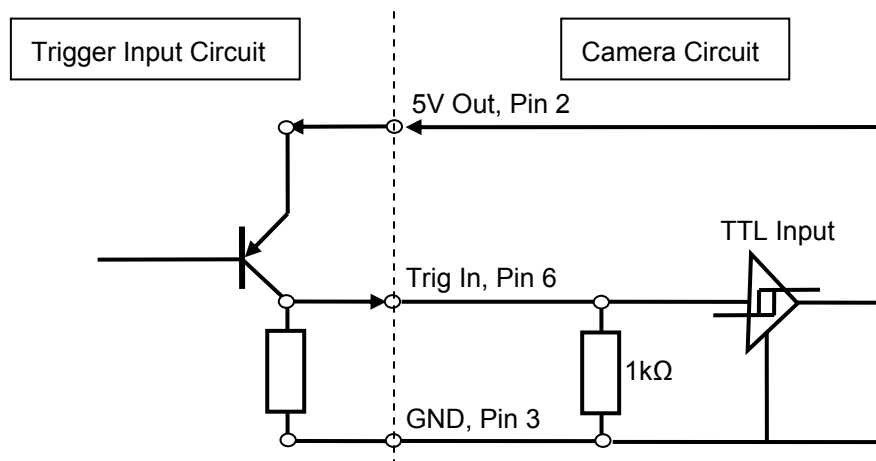
| | |
|-----------------------------|---|
| input voltage: | 3-5 V (TTL, CMOS) |
| input current: | 3mA @ 3V / 5mA @ 5V |
| limiting resistor: | none |
| knee voltage: | 1.5 V |
| reverse voltage protection: | none |
| switching delay: | Max. 2µsec + interrupt latency |
| Capture delay | Approx 40µsec (constant), for jitter free operation |



Note the modified circuit of the trigger input, due to the additional RS232 interface. Old trigger input circuits need to be modified in order to prevent damaging the trigger input of the VC40XX camera. The trigger input now needs to be connected to GND (camera GND). The use of a transistor in the trigger input circuit is recommended as shown in the following figures.

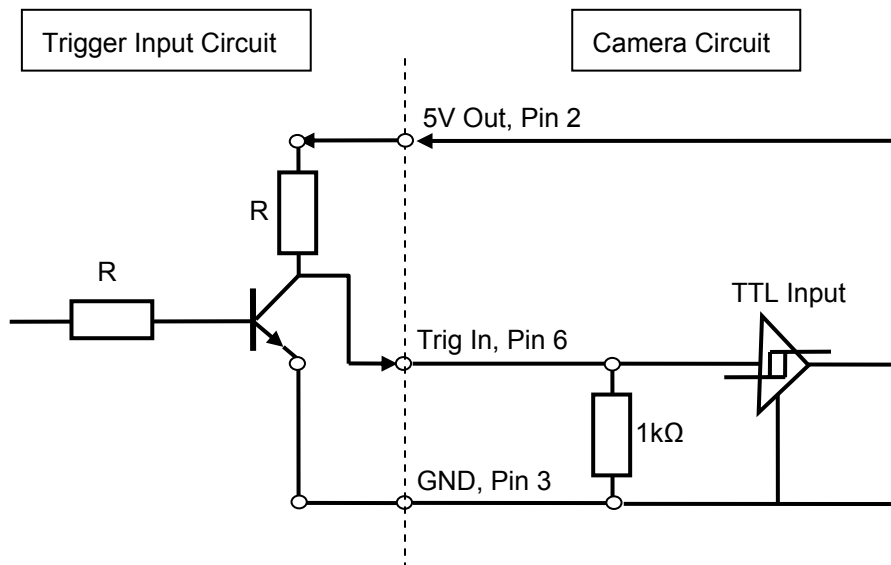
Please also note that the GND of the Trigger/ RS232 interface is not identical with the Power Supply/ PLC GND, GND IN com. (refer to section 4.3).

Suggested Trigger Input Circuit PNP

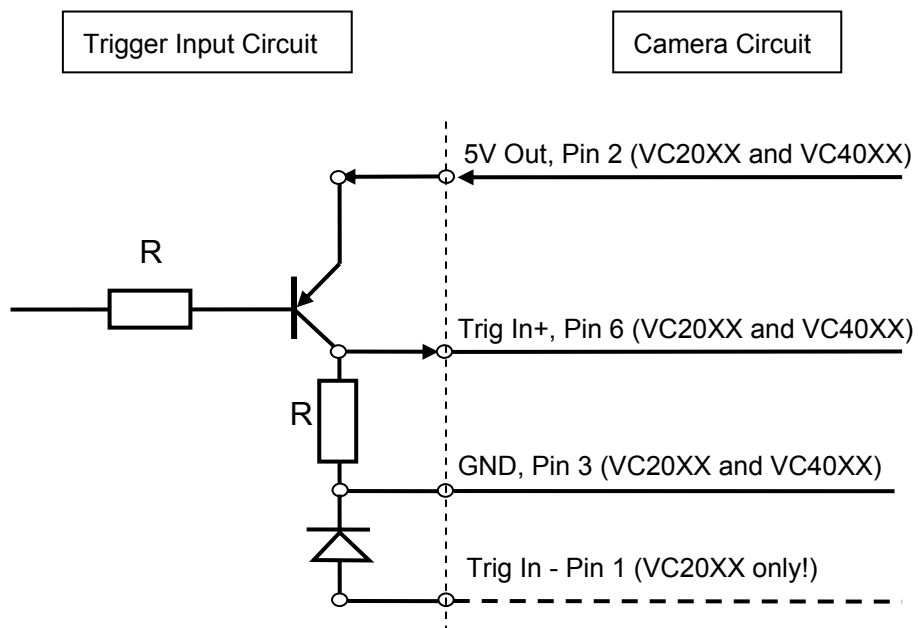


The 1kΩ internal pull down resistor is not included in the initial hardware release (delivery until end of 2005). Please provide external pull down resistor in case the trigger input stays high.

Suggested Trigger Input Circuit NPN



Trigger Input Circuit compatible to VC20XX and VC40XX cameras:

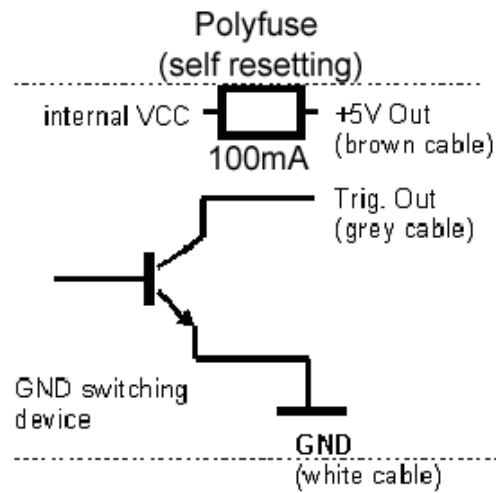


The trigger input circuit shown above can be used to connect both – the VC20XX and VC40XX smart camera families.

Technical data of trigger output:

| | |
|-------------------|----------------------------------|
| output voltage: | max. 7V |
| output current: | max. 50mA |
| pull-up resistor: | none, external resistor required |

Note that the 100 Ω Resistor protecting the +5V output of the VC20XX series has been replaced with a self resetting poly fuse (see the following drawing).



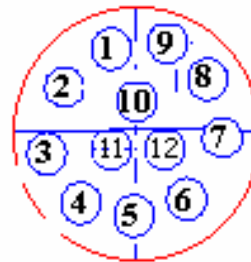
4.3 Power Supply and IO Interface

This connector includes the camera Power Supply and digital PLC IOs.

4.3.1 Pin assignments Power Supply and IO Interface

| Pin | Signal |
|-----|-------------|
| 1 | 24V PLC |
| 2 | 24V IN Cam |
| 3 | GND IN com. |
| 4 | INP 1 |
| 5 | OUT 3 |
| 6 | OUT 2 |
| 7 | OUT 1 |
| 8 | OUT 0 |
| 9 | 24V PLC |
| 10 | INP 3 |
| 11 | INP 2 |
| 12 | INP 0 |

rear view camera socket:



4.3.2 Electrical specifications Power Supply and IO Interface

Power must be connected to the 12pin I/O connector. Note, that the voltage is 24V.

Camera power is regulated and galvanically separated inside the camera, so only an unregulated power source of 24 V +/- 20% is required. The camera is, however, very sensitive to power supply interruption. Please make sure, that the voltage never exceeds the limits of +/- 20% even for a short period of time. In case of unstable power supply it is recommended to backup the power supply by a capacitor or a battery large enough to prevent power interruptions.

The camera has several internal circuits to detect and protocol power failures. Used correctly these internal flags can be used to perform a correct shutdown and close all open buffers (see below). This feature is for emergency only and is not designed to handle very frequent interruptions.

There are different options for the connection of the power supply:

- Single voltage, with or without PLC signals, no shutdown
- Dual voltage, with or without PLC signals, shutdown

4.3.2.1 Single voltage, with or without PLC signals, no shutdown:

| Signal | Pin No. | color | connect to |
|-------------|---------|-----------|------------------|
| 24V IN Cam | 2 | red/blue | 24V power supply |
| 24V PLC | 1 | red | 24V power supply |
| 24V PLC | 9 | blue/pink | 24V power supply |
| GND IN com. | 3 | black | GND power supply |

This option does not provide shutdown. Programmer must implement their own procedures for fail-safe operation.

4.3.2.2 Dual voltage, with or without PLC signals, shutdown

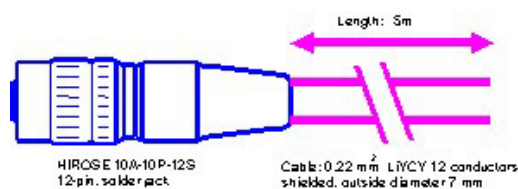
| Signal | Pin No. | color | connect to |
|-------------|---------|-----------|-------------------|
| 24V IN Cam | 2 | red/blue | 24V backup supply |
| 24V PLC | 1 | red | 24V power supply |
| 24V PLC | 9 | blue/pink | 24V power supply |
| GND IN com. | 3 | black | GND power supply |

Here, the PLC voltage (24V PLC) is connected directly to the power supply. If a power failure occurs or if power is switched off, the camera will detect this signal not being present. The internal flag generated can be utilised to shut down the camera correctly and resume operation after a power failure. The following procedures can be performed:

1. Stopping the operation of all programs and interrupts (no pictures will be taken any longer).
2. Saving all buffers (to multi-media card or flash EPROM).
3. Protocol time and date of the shutdown.
4. The procedure then waits for the backup voltage to disappear or main power to re-establish. If the latter happens the program might be able to continue where it has stopped. (In this case there may be some lost images = some parts not checked correctly)

The backup voltage must be able to supply specified voltage for a period of at least 100 msec.

4.3.3 Available Accessories / Cables for Power Supply and IO Interface



| Signal | Pin No. | Cable color |
|-------------|---------|-------------|
| OUT0 | 8 | white |
| OUT1 | 7 | brown |
| OUT2 | 6 | green |
| OUT3 | 5 | yellow |
| IN0 | 12 | grey |
| IN1 | 4 | pink |
| IN2 | 11 | blue |
| IN3 | 10 | purple |
| 24V IN Cam | 2 | red/blue |
| GND IN com. | 3 | black |
| 24V PLC | 1 | red |
| 24V PLC | 9 | grey /pink |

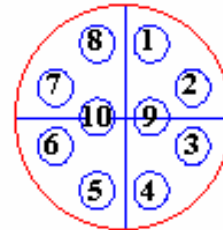
Equipped on one end with a Hirose plug jack, length 5m, 10m or 25m
Refer to section 5 for a list of available cables with order numbers.

4.4 Video Output Interface

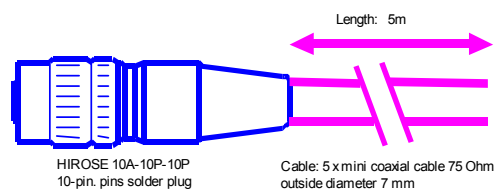
4.4.1 Pin Assignment of Video Output Interface

| Pin | Signal |
|-----|--------|
| 1 | G GND |
| 2 | G Out |
| 3 | R GND |
| 4 | R Out |
| 5 | VS GND |
| 6 | VS Out |
| 7 | HS GND |
| 8 | B GND |
| 9 | B Out |
| 10 | HS Out |

rear view camera socket:



4.4.2 Available Accessories / Cables for Video Output Interface



| Signal | Pin No. | Connection |
|--------|---------|--------------|
| R Out | 4 | red signal |
| R GND | 3 | red shield |
| G Out | 2 | green signal |
| G GND | 1 | green shield |
| B Out | 9 | blue signal |
| B GND | 8 | blue shield |
| HS Out | 10 | white signal |
| HS GND | 7 | white shield |
| VS Out | 6 | gray signal |
| VS GND | 5 | grayshield |

Equipped on one end with a Hirose plug, length 5m, 10m and 25m.

Please order "with 2nd connector", if you need a DSUB15 connector at the other end.

Refer to section 5 for a list of available cables with order numbers.


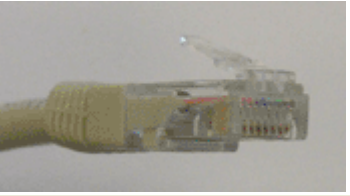

5 Accessories

For interface cables and connectors available also consult the corresponding section in chapter 4 of this manual.


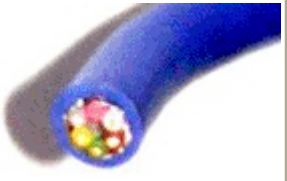
Order numbers different camera models:

| Article Description | Order Number |
|---------------------|--------------|
| VC4038E | VK000230 |

Ethernet Cables (Refer to section 4.1.2):


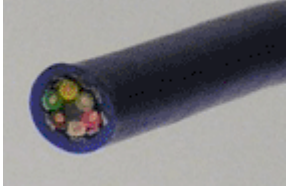


| Article Description | Order Number | Camera Connector | Second Connector |
|-----------------------|--------------|---|--|
| 5m LAN-C6-Cable | VK000149 | HRS connector female 6 pin  | RJ45  |
| 10m LAN-C6-Cable | VK000150 | HRS connector female 6 pin | RJ45 |
| 20m LAN-C6-Cable | VK000151 | HRS connector female 6 pin | RJ45 |
| Ethernet Cross Module | VK000156 |  RJ45 | RJ45 female socket |

Trigger Cables (Refer to section 4.2.2):



| Article Description | Order Number | Camera Connector | Second Connector |
|------------------------|--------------|--|--|
| 5m Trigger-Cable / C6 | VK000115 | HRS connector male 6 pin  | without connector  |
| 10m Trigger-Cable / C6 | VK000164 | HRS connector male 6 pin | without connector |
| 25m Trigger-Cable / C6 | VK000153 | HRS connector male 6 pin | without connector |

V24 (RS232) Serial Cable (Refer to section 4.2.3):

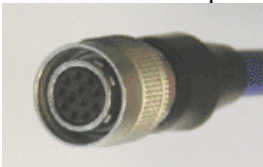

These cables differ from the serial VC20XX C6 cables!

| Article Description | Order Number | Camera Connector | Second Connector |
|-------------------------|--------------|--|---|
| 5m V24 cable | VK000243 | HRS male 6 pin  | without connector  |
| 5m V24 cable with DSUB | VK000244 | HRS male 6 pin  | D-SUB 9 pin female  |
| 10m V24 cable | VK000239 | HRS male 6 pin | without connector |
| 10m V24 cable with DSUB | VK000240 | HRS male 6 pin | D-SUB 9 pin female |
| 25m V24 cable | VK000241 | HRS male 6 pin | without connector |
| 25m V24 cable with DSUB | VK000242 | HRS male 6 pin | D-SUB 9 pin female |

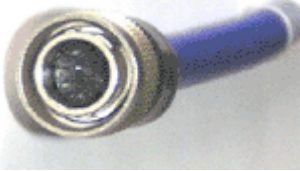
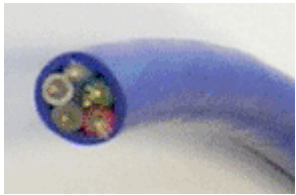
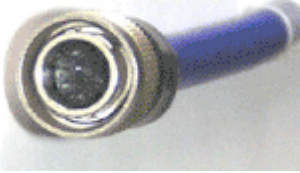

Y-Cable for connecting several cables to the Trigger / Serial Interface (Refer to section 4.2.4):

| Article Description | Order Number | Camera Connector | Second Connector |
|----------------------|--------------|--|---|
| 0.5m Y adapter cable | VK000124 | HRS male 6 pin  | 2 HRS female 6 pin  |

Power Supply and IO Interface Cables (refer to section 4.3.3):

| Article Description | Order Number | Camera Connector | Second Connector |
|--------------------------|--------------|---|--|
| 5m Power / PLC-Cable C6 | VK000008 | HRS female 12 pin  | without connector  |
| 10m Power / PLC-Cable C6 | VK000114 | HRS female 12 pin | without connector |
| 25m Power / PLC-Cable C6 | VK000161 | HRS female 12 pin | without connector |

VGA Video Output Cable (refer to section 4.4.2):

| Article Description | Order Number | Camera Connector | Second Connector |
|--------------------------|--------------|---|---|
| 5m SVGA-cable | VK000006 | HRS connector male 10 pin  | without connector  |
| 5m SVGA-cable with DSUB | VK000083 | HRS connector male 10 pin  | HD-SUB 15 pin male  |
| 5m SVGA-cable with DSUB | VK000079 | HRS connector male 10 pin | HD-SUB 15 pin female |
| 10m SVGA-cable | VK000061 | HRS connector male 10 pin | without connector |
| 10m SVGA-cable with DSUB | VK000133 | HRS connector male 10 pin | HD-SUB 15 pin male |
| 10m SVGA-cable with DSUB | VK000080 | HRS connector male 10 pin | HD-SUB 15 pin female |
| 25m SVGA-cable | VK000065 | HRS connector male 10 pin | without connector |
| 25m SVGA-cable with DSUB | VK000098 | HRS connector male 10 pin | HD-SUB 15 pin male |
| 25m SVGA-cable with DSUB | VK000082 | HRS connector male 10 pin | HD-SUB 15 pin female |

Further Accessories:

| Article Description | Order Number | Camera Connector |
|---|--------------|--|
| Power Adapter C6 24V, with 12 pins conn. 3m | VK000119 | HRS connector female 12 pin  |
| Power adapter for rail mounting, Input Voltage 100 - 240VAC 50/60 Hz, Output Voltage DC 24V +/-5%, max. 300 mA (7.5 W), Equipped with connecting clamps for AC input and 24V output, CE cert. | VK000036 |  |
| VCSKBC4 Keypad (different from VCSKBC6 for VC20XX cameras!) | VK000238 |  |
| IR cut filter (camera is shipped with this filter mounted) refer to Appendix E | EK000625 | |
| Clear glass filter (replaces IR Cut filter) | EK000624 | |

Flex cables for detached Camera Head mounting:

| | |
|-------------------------|----------|
| 30mm length,20 core | EK000321 |
| 80 mm length,20 core | EK000322 |
| 200 mm length,20 core | EK000629 |
| 1000 mm length,20 core | EK000631 |
| 18000 mm length,20 core | EK000630 |

Please also refer to the VC website www.vision-components.com for an up to date list of accessories.

6 Programming VC40XX Smart Cameras

This section contains special programming features for the VC40XX smart camera series. Standard software functions are described in following manuals:

| Type of resource | Name of file | Download location www.vision-comp.com |
|--------------------------------------|--|---|
| SW manual OS functions | VCRT5.pdf | Support->Reg. User Area->SW Manuals |
| SW manual Image Processing Functions | VCLIB_2_0.pdf VCLIB_300.pdf | Support->Reg. User Area->SW Manuals |
| Installation Manual | InstallVC20XX_VC40XX | Support->Customer Area->Getting Started VC20XX ... |
| Programming Tutorial Basic | Programming Tutorial for VC20XX and VC40XX Cameras | Support->Customer Area->Getting Started VC20XX ... |

6.1 Programming the additional Serial Interface

The following program shows the programming of the VC40XX serial interface (refer to section 4.2):

```
#include <register.h>
#include <vcrt.h>
#include <sysvar.h>

main()
{
FILE *tty;
//unsigned xbaud=115200;
unsigned xbaud=9600;
char c=0;

print("TEST RS485 serial I/O\n");

tty = fopen("kbd:", (void *)0);    /* open RS485 */

io_ioctl(tty,IO_IOCTL_SERIAL_SET_BAUD,&xbaud);

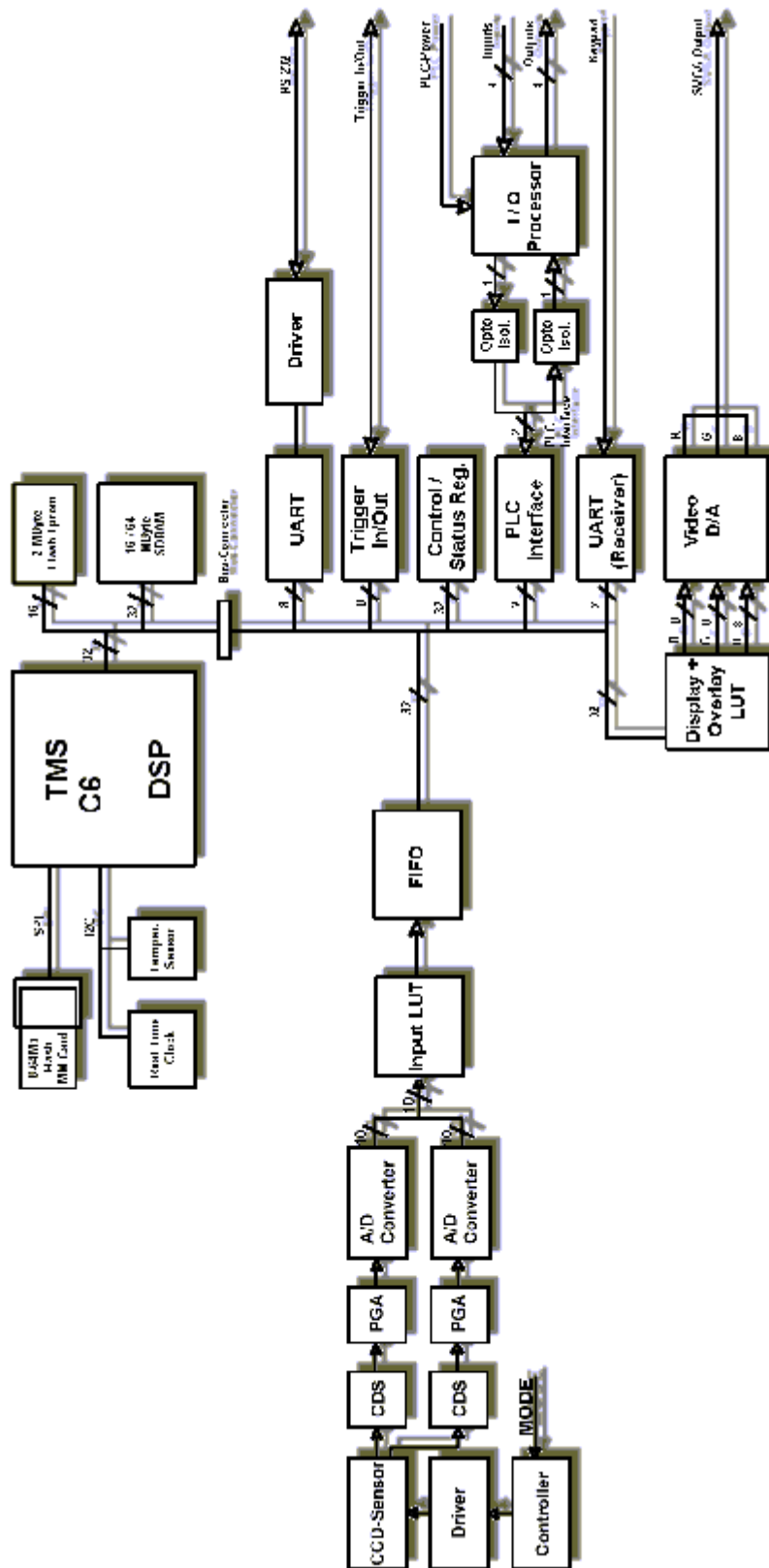
write(tty,"abcdefg",7);

rs232rcv();

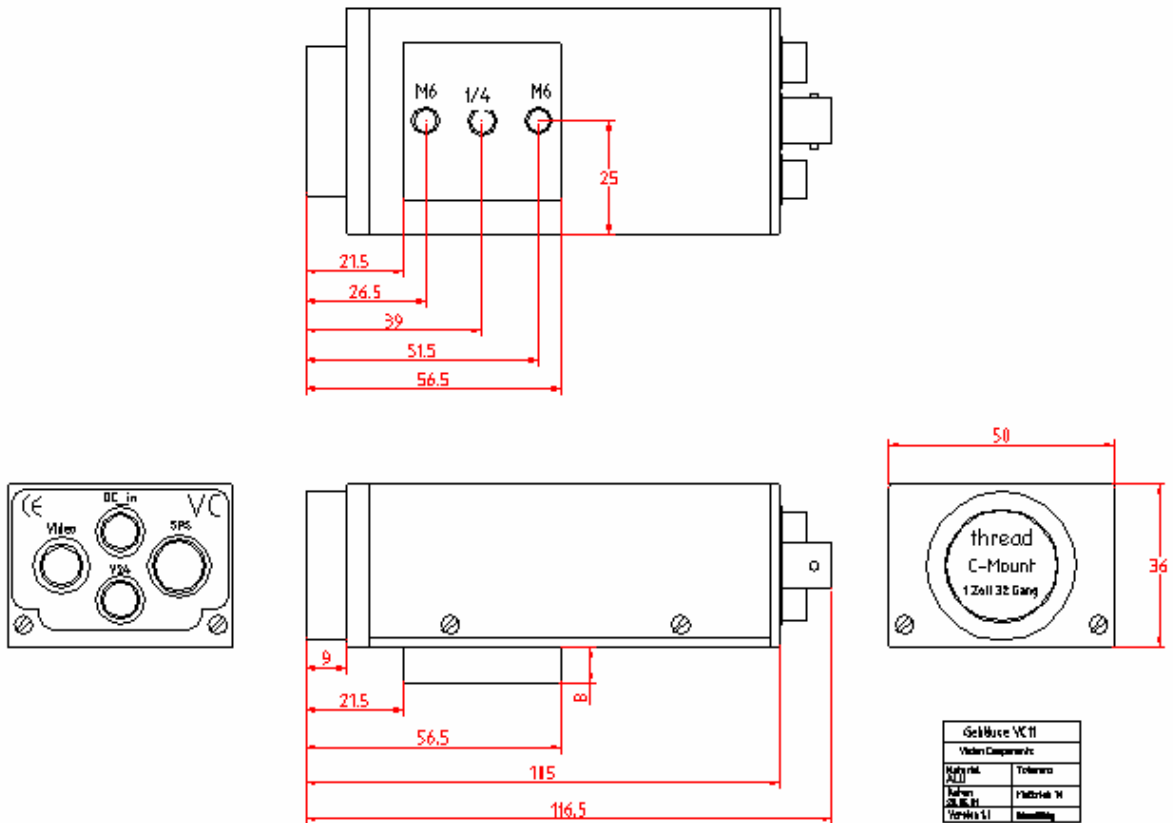
while(c != 0x1b)
{
c=rs232rcv();
// c=io_fgetc(tty);
io_fputc(c, tty);
c=io_fgetc(tty);
rs232snd(c);
}

fclose(tty);    /* close RS485 */
}
```

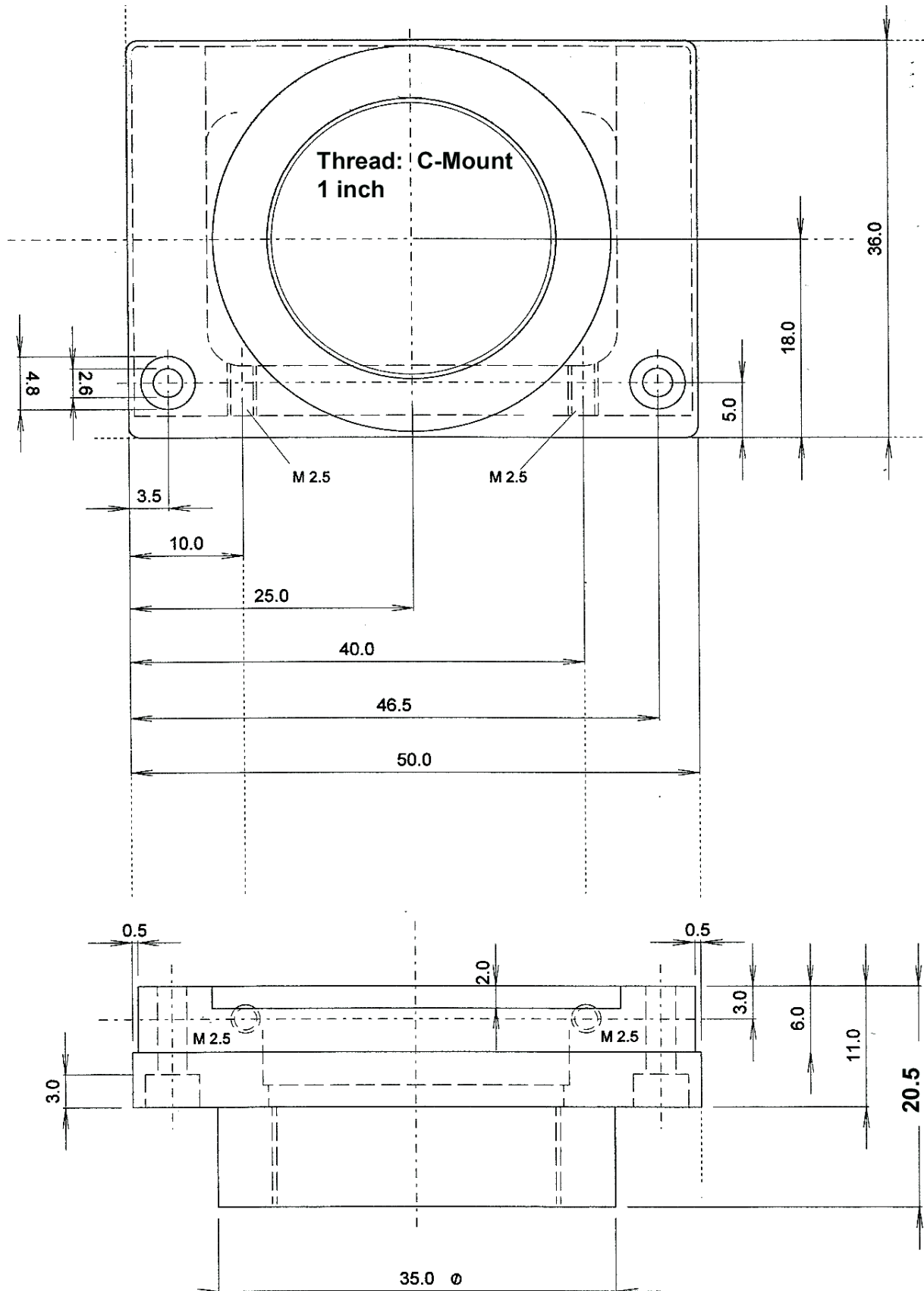
Appendix A: Block diagram VC40XX Smart Cameras



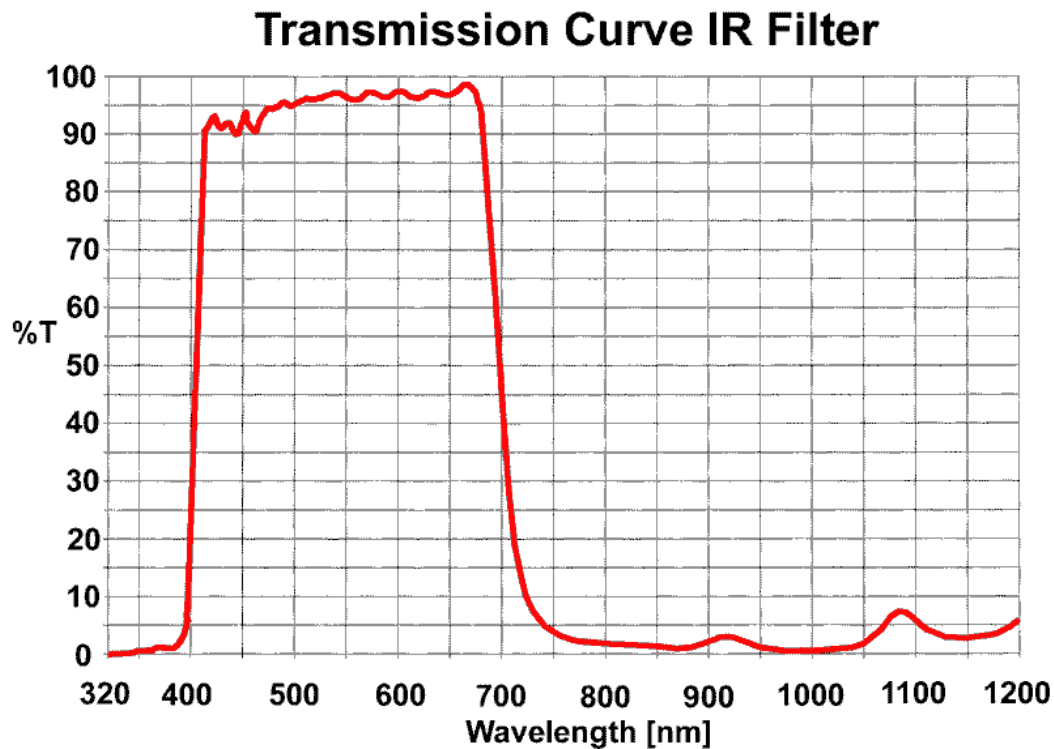
Appendix B: Overall Dimensions Housing VC40XX



Appendix D: Drawing Camera Head VC40XX



Appendix E: Spectral Transmission of IR Filter



Note:

This IR cut filter is incorporated in every VC40XX camera. The IR filter can be removed if required without losing Vision Component's manufacturer's warranty. In this case, special care must be taken not to damage the CCD sensor.

If the camera is used without IR filter it is important to replace it by a clear glass filter of the same size. The C-mount flange distance from the CCD is accurately adjusted for the use of the IR filter – removing the filter decreases the length of the optical path and it may become impossible to focus some lenses to a larger working distance.



If the IR filter is not to be used, please order your camera with a clear glass filter or contact Vision Components for obtaining a glass filter.

The order numbers for the clear glass filter is: EK000624

The order number for the IR cut filter (standard) is: EK000625

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