Smart Cameras made in Germany

Vision Components

The Smart Camera People

VC Smart Camera QuickStart
in 10 Steps

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W W W . V I S I O N - C O M P O N E N T S . C O M

Vision Components®
The Smart Camera People

since 1996

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PART I

A QUICK START

1   Software overview

Thank you for using a VC Smart Camera! This guide will help you get started as quickly as possible with your new product.

For programming VC Smart Cameras the following **Software Tools** are needed:

On the PC	On the camera
Texas Instruments Code Composer Studio **v6** & Code Generation Tools **IDE & C/C++ Cross Compiler**	Vision Components **VCRT Operating system** (already installed on the camera)
Vision Components VCRT library **OS C library**	
Vision Components VCLIB **Image processing C library**	
Vision Components Extension Lib, Color Lib, Smart Finder, Smart Reader… **Additional & optional image processing libraries**	

This manual describes how to:

- **get and install** the necessary software
- establish **communication** with the camera
- **compile** and run camera programs.

This guide describes the **installation with CCS v6**, for versions 3.x and 4.x check the older Getting Started document! For version 5.x check the previous version of this document. CCS v6 can be installed together with CCS v3/v4/v5 if one of these is already installed.

2 Creating a new account on the VC website

1. To access the download center on the Vision Components website **it is necessary to register** on this page: **http://www.vision-components.com/en/service/register/**. After registration it is possible to download the **hardware and software documentation**.

VC registering page

2. To be able to download the libraries and other software, the **VC licence code(s)** (**full licence** or **loan licence,** can be found on the invoice) must be registered here: **http://www.vision-components.com/en/service-support/download-center/software-request/**.

Software request

3. The main licence code (**VC SDK-TI**, for using the VCLib and the VCRT Lib) is under the form **T1122334455** or **LT1122334455** and is necessary for programming. See **part II, chapter 2** for more details.

4. After a short time you will receive a confirmation email from us and the access to your software downloads will be activated (depending on the licence codes you registered).

You are here: Service & Support / Download-Center / Software

Home	**Your software download**
Competences	
Solutions	On the following pages we activated your software files. You find this pages via the main navigation or by clicking the following links:
Products	
News & Events	• VC Libraries
Service & Support	• VCRT Camera Operating System
Contact	• VC nano 3D Software
Download-Center	• VC Demo Programs
Documentations	• Software Utilities
Software	• OpenCV
VC Libraries	
VC Camera OS	Please fill in the software request form, **if the software you wish is not available here.** Thank you!
VC nano 3D	
Demo Programs	**Software request**
Software Utilities	
OpenCV	Please fill in the software request form to access your software download. Please find the required licence code in your shipping list.
Software Request	
Tech News	
Knowledge Base/FAQ	
Return/Repair Service	
Loan Systems	
Logout	

Software download page

⚠ N.B. **The user name is always the email address!**

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3 Connecting the camera

1. Connect **LAN cable**, **Power/PLC cable** (or directly **power supply**) and if available VGA cable on the correct connectors. The LAN cable must be connected to the PC through a switch or a cross cable.
2. If your camera does not have a VGA output, live images can be transferred using our image transfer demo, check **the last chapter** of part I.
3. Depending on the camera model you can connect the **Trigger / RS232 cable**, if you want to test these interfaces.

A detailed hardware documentation for each camera series, including description of the connector pins, is available on the VC website: **http://www.vision-components.com/en/service-support/download-center/documentations/hardware-dokumentation/** (link active **after registration and login**).

4 PC TCP/IP settings

1. All VC Cameras have the **IP address 192.168.0.65** at delivery.
2. Therefore, set the PC IP address to a **compatible address** – e.g. 192.168.0.20, subnet mask
    255.255.255.0.
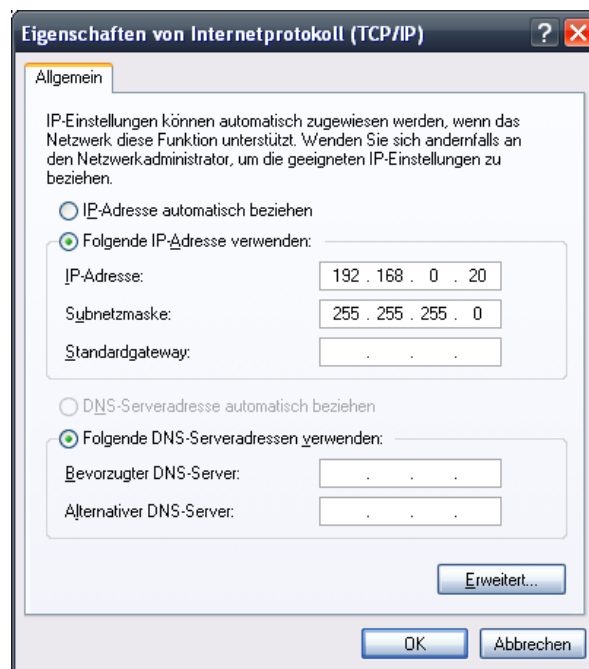
TCP/IP settings under Windows XP

3. You can **test the connection**, by sending a **ping** command to the camera ("ping 192.168.0.65")
    from the command line. If the camera does not respond, refer to the **communication
    troubleshooting** chapter.
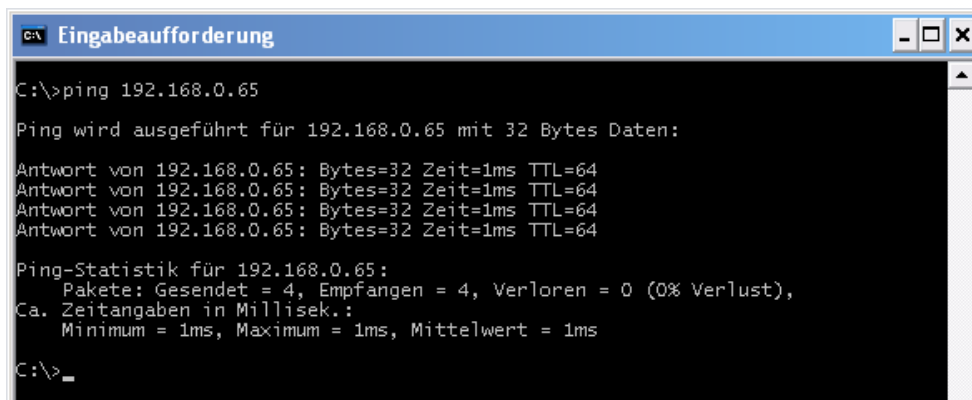
Ping command under Windows command line

5 Connecting to the camera shell

1. For a first hands-on, we will now establish a connection to the user interface of VCRT: the camera shell.

2. Download the terminal program TeraTerm from the following website: **http://en.sourceforge.jp/projects/ttssh2/releases/**. Install the program. You can also use another terminal program of your choice.

3. Connect to the camera on the telnet port 23:
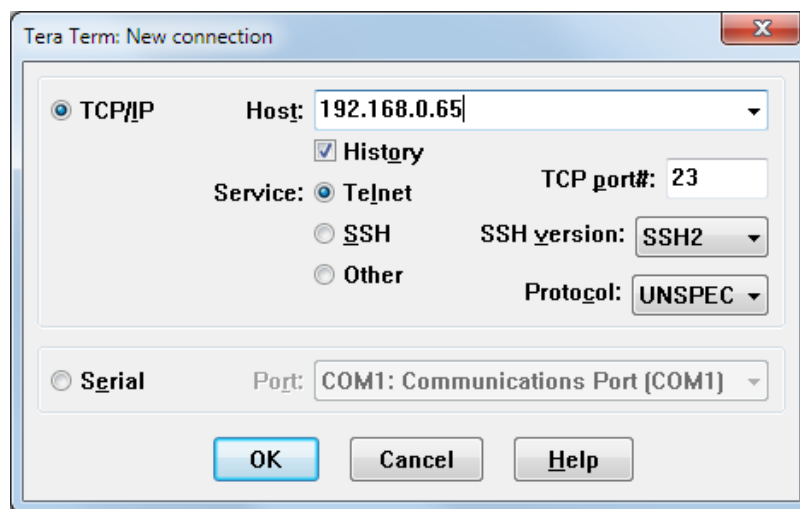
TeraTerm connection dialog

4. You are now connected to the camera shell.
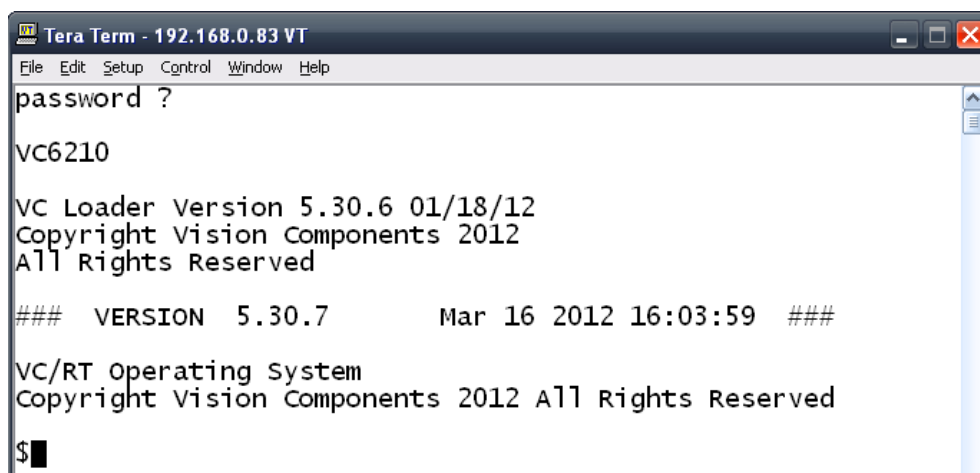
VCRT: the camera shell

5. Some camera functions are available directly from the shell; in the table below are some examples. The execution of shell commands must be confirmed with <Return>.

Function	Command
Program **execution**	$programname
Upload programs from the PC to the camera flash memory	$lo <activation of the upload function of the terminal program>
Show files on the Flash (SD card)	$dir ($dir md:/)
Delete a file	$del filename
Pack flash memory (physically erases previously deleted files)	$pk
Take a picture	$tp
Save an image as a **bmp file** (or **jpeg** file)	$bs imgname ($js imgname)
Switch image capture to "still" (live) mode.	$vd -d (vd -l)
Change **shutter time**	$sh <value in microseconds>
Show **VCRT version**	$ver
Show the contents of a **text file**	$type filename (for example $type #ID)

```
$type #ID
type ascii file
model: VC6210
S/N:    7100082
DC:     06/15/11 11:10:16
MAC:    00-06-1F-6C-56-B2

$ver
print software version
VC6210
HEAD Version 5.30.7  Mar 16 2012
CPLD Version: 4

$sh 15000
set shutter value
new shutter value: 14994 usec

$dir
directory of files
user files

path: fd:/user/
#IP         001         40
ltube       014         7266
m           128         798228
mvn_task    128         24546
mvnova      014         2100
```

Examples of shell commands

6. The full commands list can be displayed using the command **"help"**. A full description of the commands is available in the VCRT documentation (**http://www.vision-components.com/en/service-support/download-center/documentations/software-dokumentation/**).

6   Downloading and installing Code Composer Studio v6
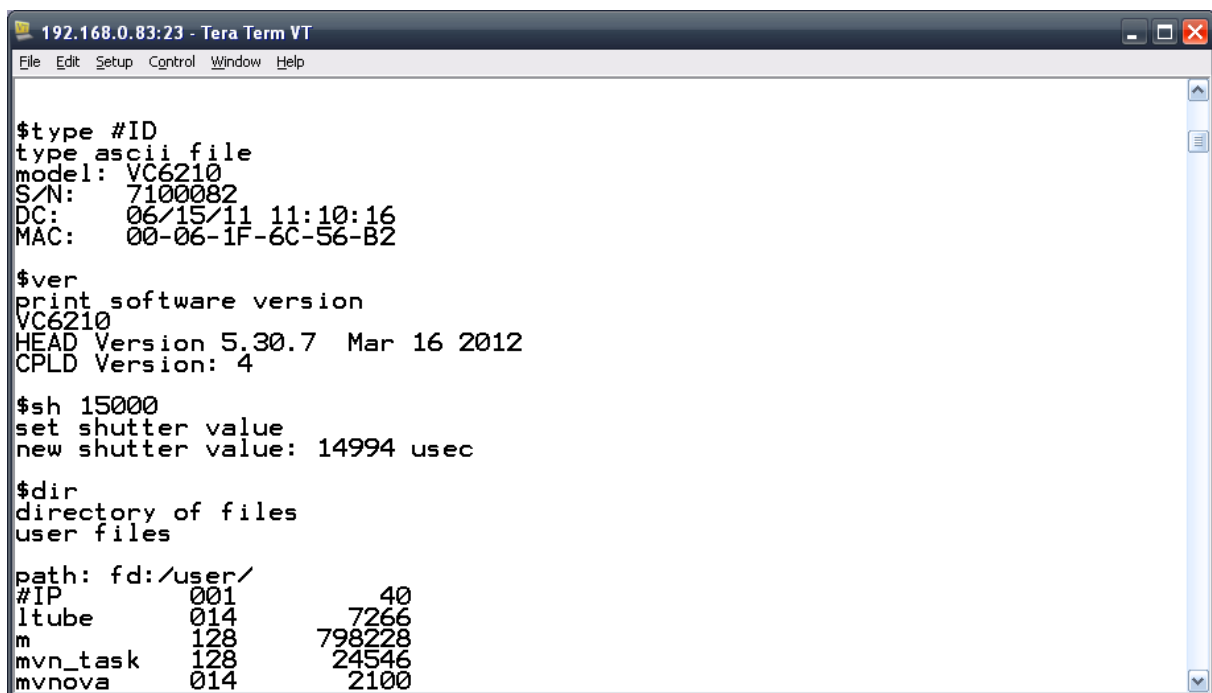
1.   Create a user account on the TI website: **www.ti.com/hdr_my_ti**

TI register page

2.   After logging in, follow this link to download Code Composer Studio v6:

   http://processors.wiki.ti.com/index.php/Download_CCS

   Always download the **latest CCS** (indicated at the top of the page, currently 6.0.1).

TI CCS download page

3. Unpack the downloaded file and execute the setup file (if needed with administrator rights under Windows).

4. In the **Installation Location** dialog set the desired install folder. For simplicity we choose **C:\ti**.
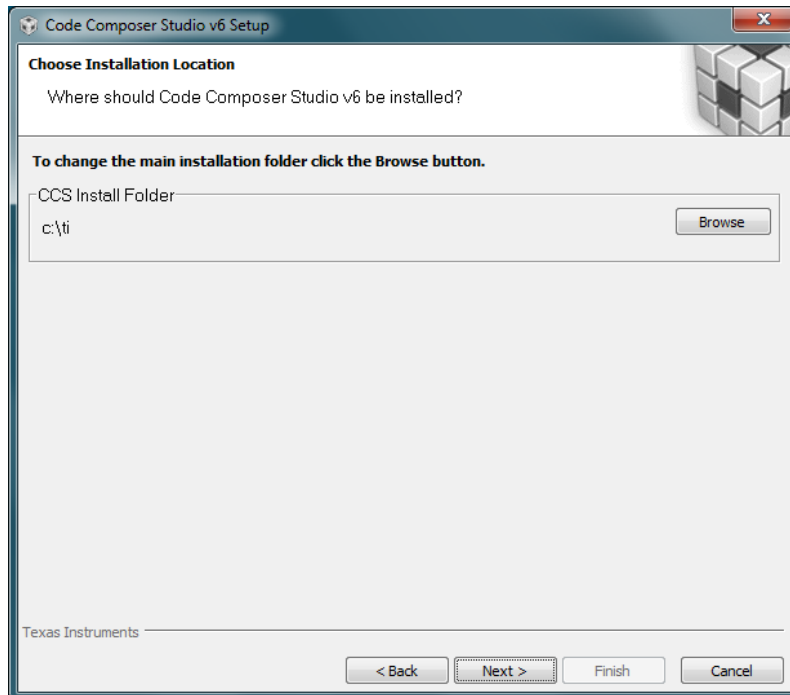
5. In the **Processor Support** dialog **C6000 Single Core DSPs** and **Media Processors (DM, DA)** are needed:
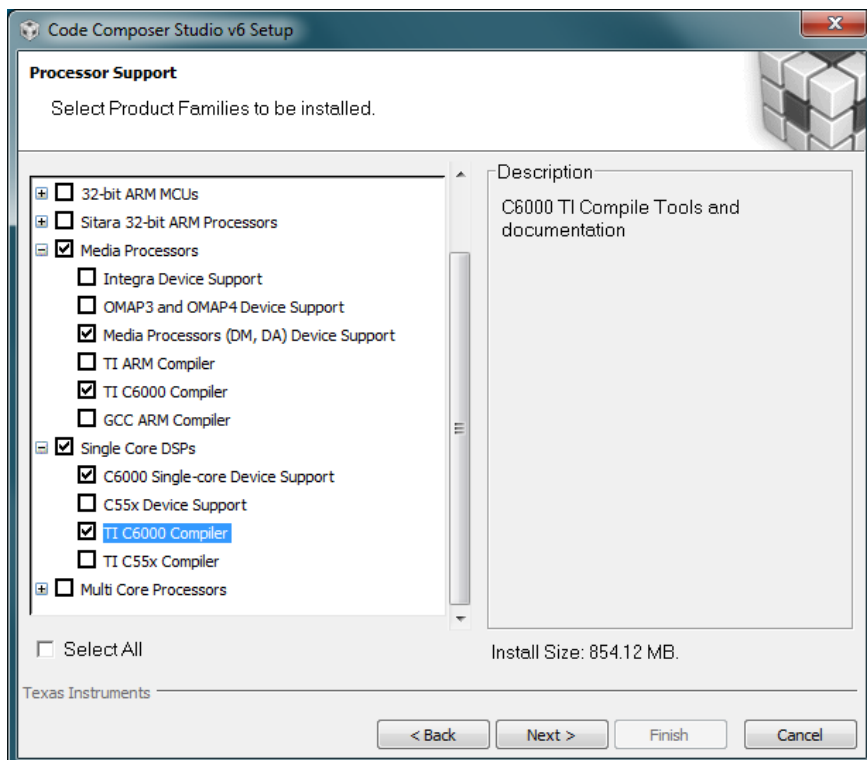
6. In the **Select Emulators** dialog uncheck all emulators if possible. Then click Finish and wait for
    the installation process to end. Do not run CCS yet.
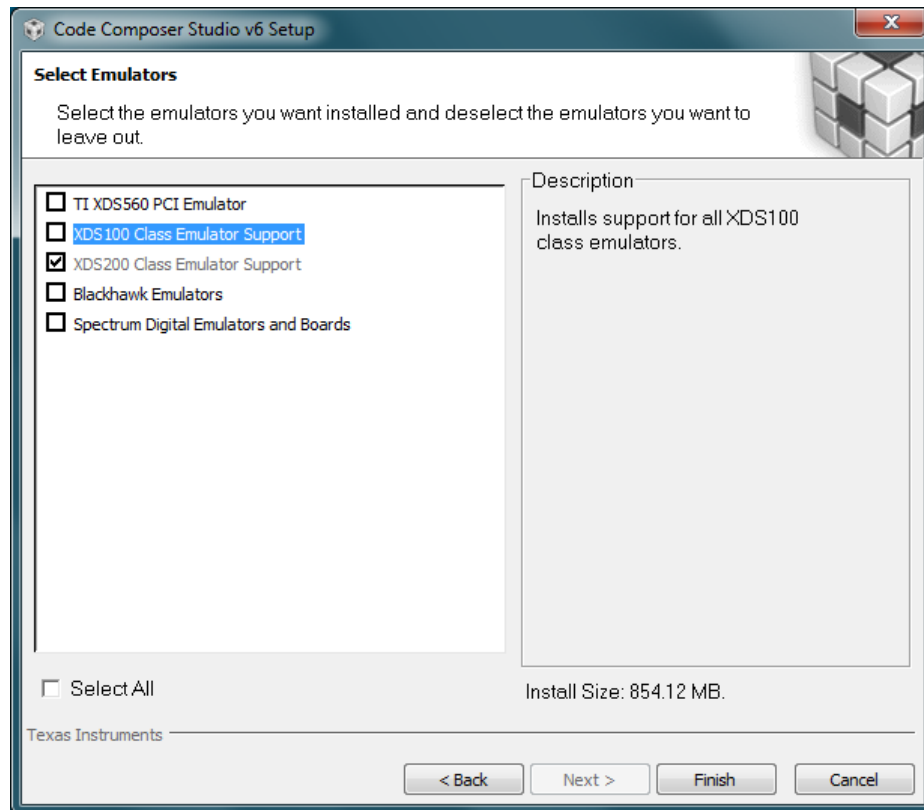
For maximum compatibility it is necessary to use the **Code Generation Tools version 6.0.31**. This
version can be downloaded on the following TI page:
https://www-a.ti.com/downloads/sds_support/TICodegenerationTools/download.htm.

Scroll down until version 6.0.31.

⚠ **Do not use the Code Generation Tools 7.x** (which are installed with CCS v6), these versions have
not yet been approved by Vision Components!

CG Tools download page

7. Download the setup file.

8. Choose **Typical** installation.
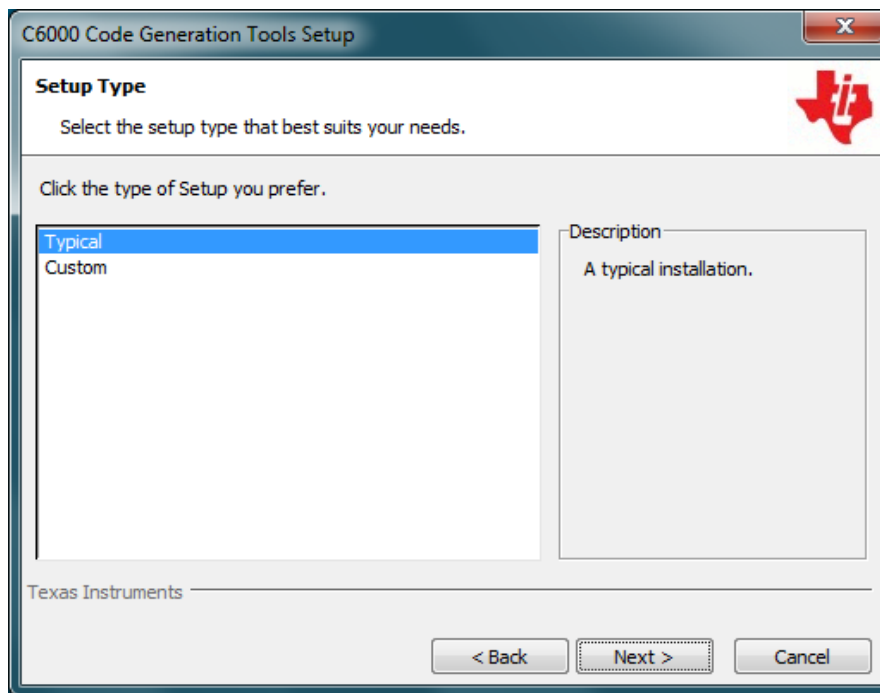
9. Choose the **same installation folder as CCS** (in our example **C:\ti**). Then click next until the installation starts.
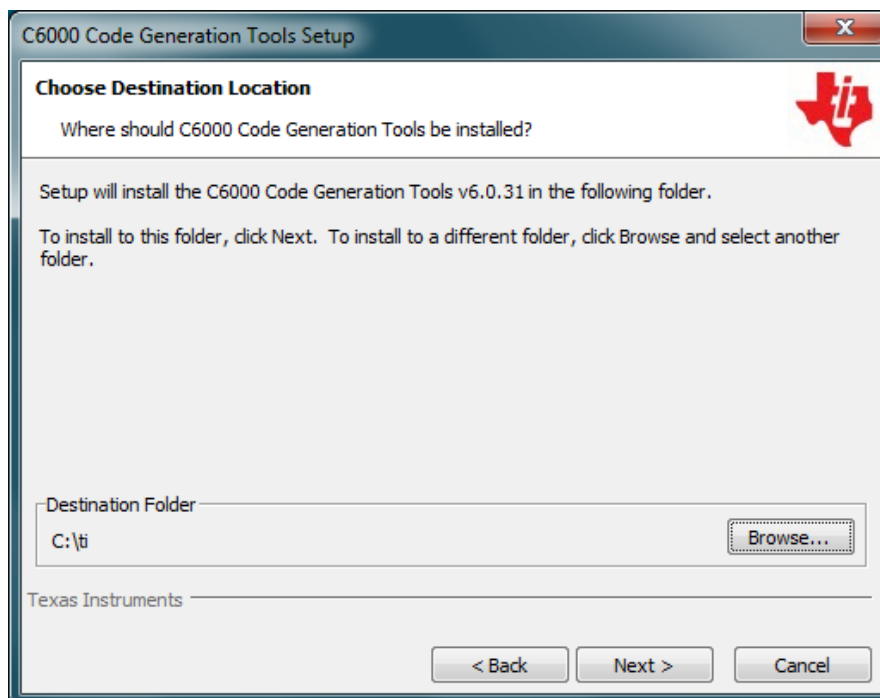
7 Downloading and installing VC Libraries

1. Download the library setup file from this page: **http://www.vision-components.com/en/service-support/download-center/software/vc-bibliotheken/**. The setup file is under the form **VCRT_5xx_VCLIB_3xx_CCS6_Setup.zip**, where 5xx and 3xx are the current versions of the **VCLIB** and **VCRT** libraries.

2. To install the libraries unzip the setup file **VCRT_5xx_VCLIB_3xx_CCS6_Setup.exe** and execute it. Choose **the same install folder as for the Code Composer Studio installation** (in our example **C:\ti**)**!**
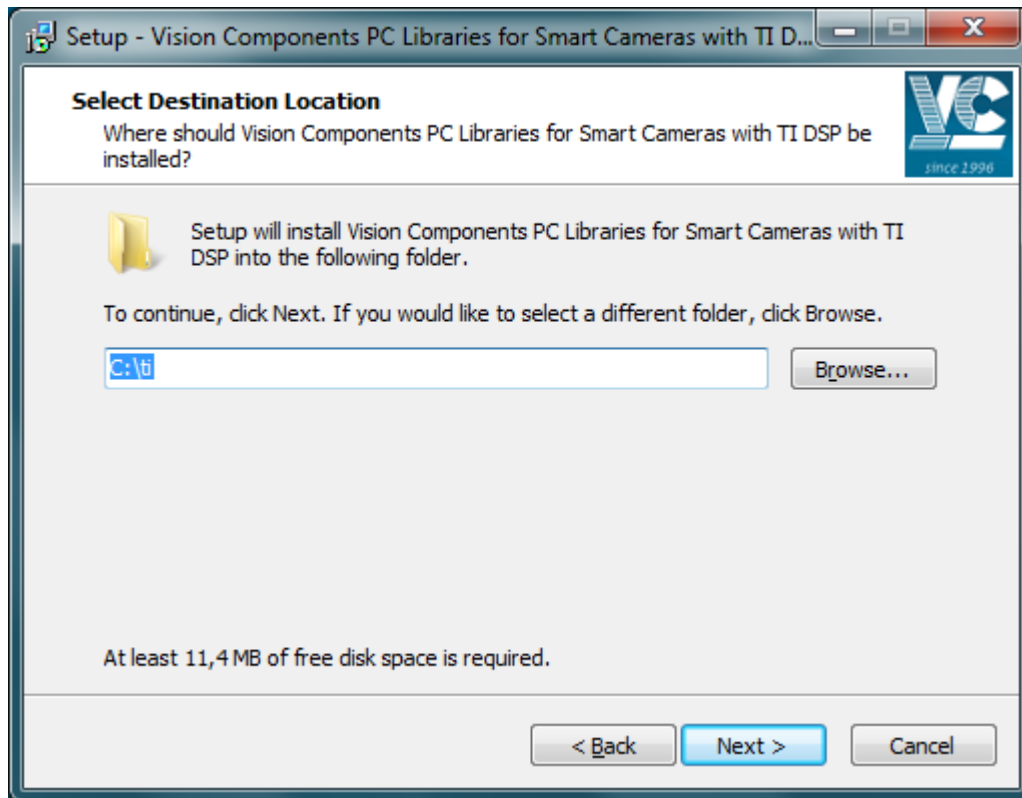
VC install setup

3. The setup file also installs a number of **example C programs** as well as a **template project for CCS v6** (containing all necessary compiling options) for an easier start in programming VC cameras.

4. The installation is now complete, the install folder looks about like this:
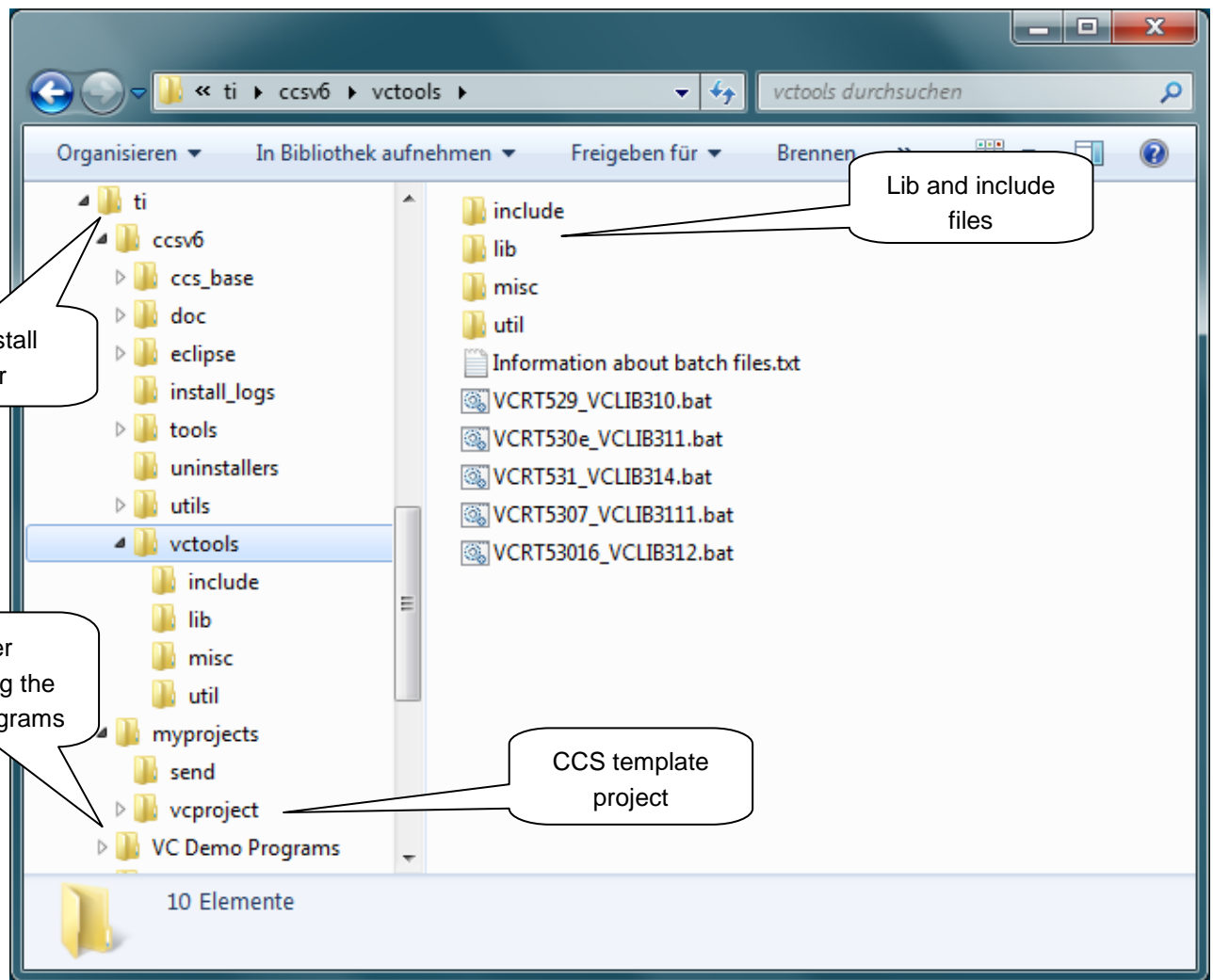
You are now ready to start CCS and compile programs!

8 Starting and configuring Code Composer Studio v6

1. Start Code Composer Studio v6.

2. A dialog appears, asking for a workspace: this is where all your CCS projects will be saved.
    Default is **C:\ti\myprojects**, where the VC template project was installed.
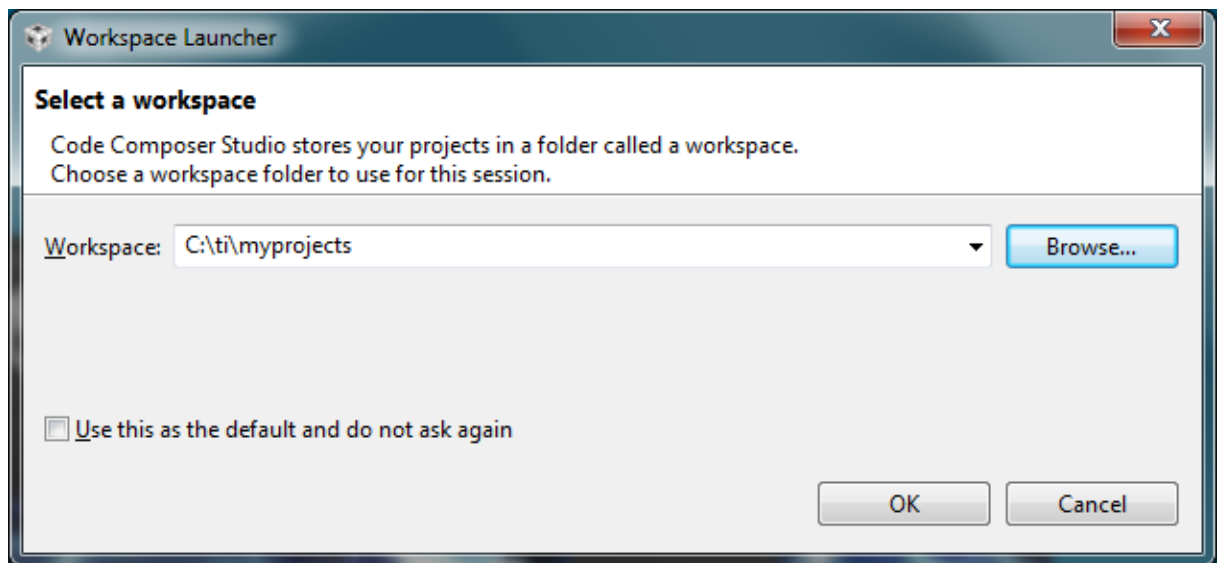
CCS workspace selection

3. You can close the Getting Started tab.

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9 Compiling a program with CCS

1. First the CCS template project provided by VC must be imported. In the "CCS Edit" perspective (top-right corner) select menu **Project → Import CCS Projects**.
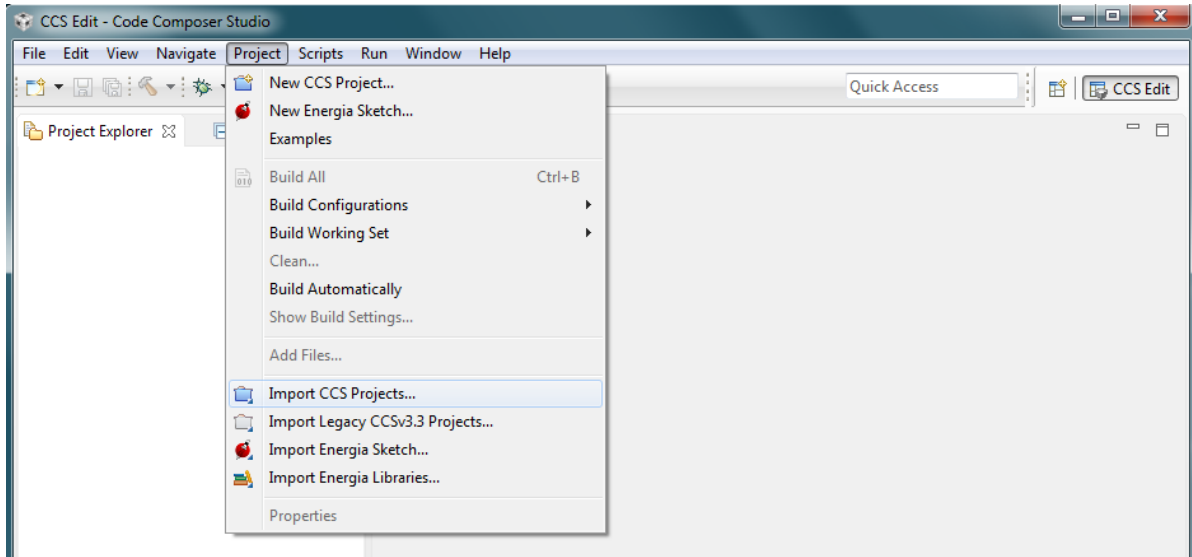
CCS window

2. In the dialog, browse to the myprojects folder (in our example C:\ti\myprojects). The template project appears in the list, confirm with **Finish**.
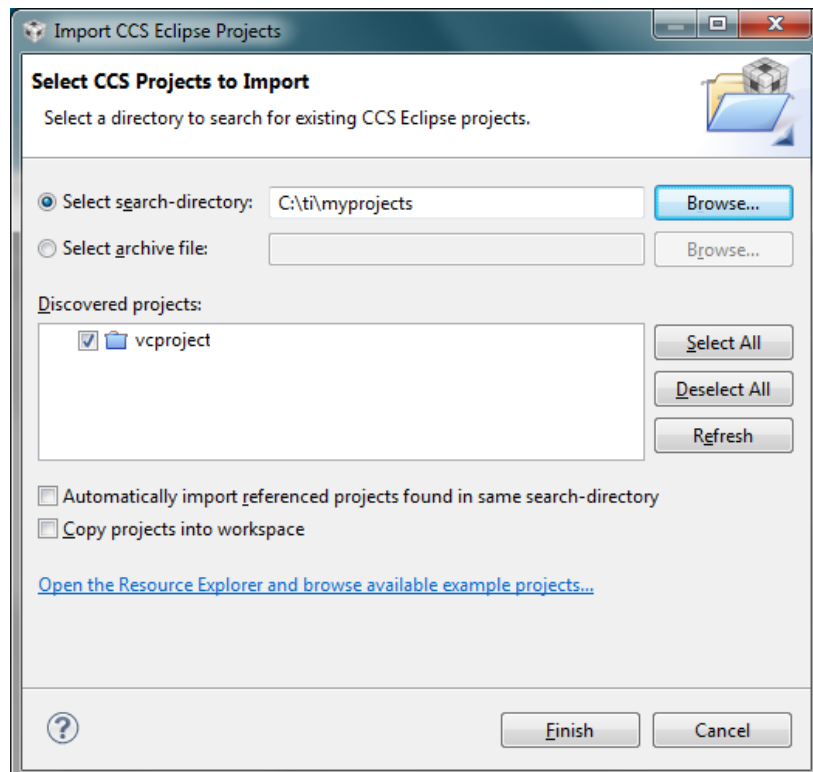
CCS project import

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3. The project appears in the left column, with the sample source code hello.c (a simple "Hello World" printout). To compile, click on the **Build** button in the tool bar.
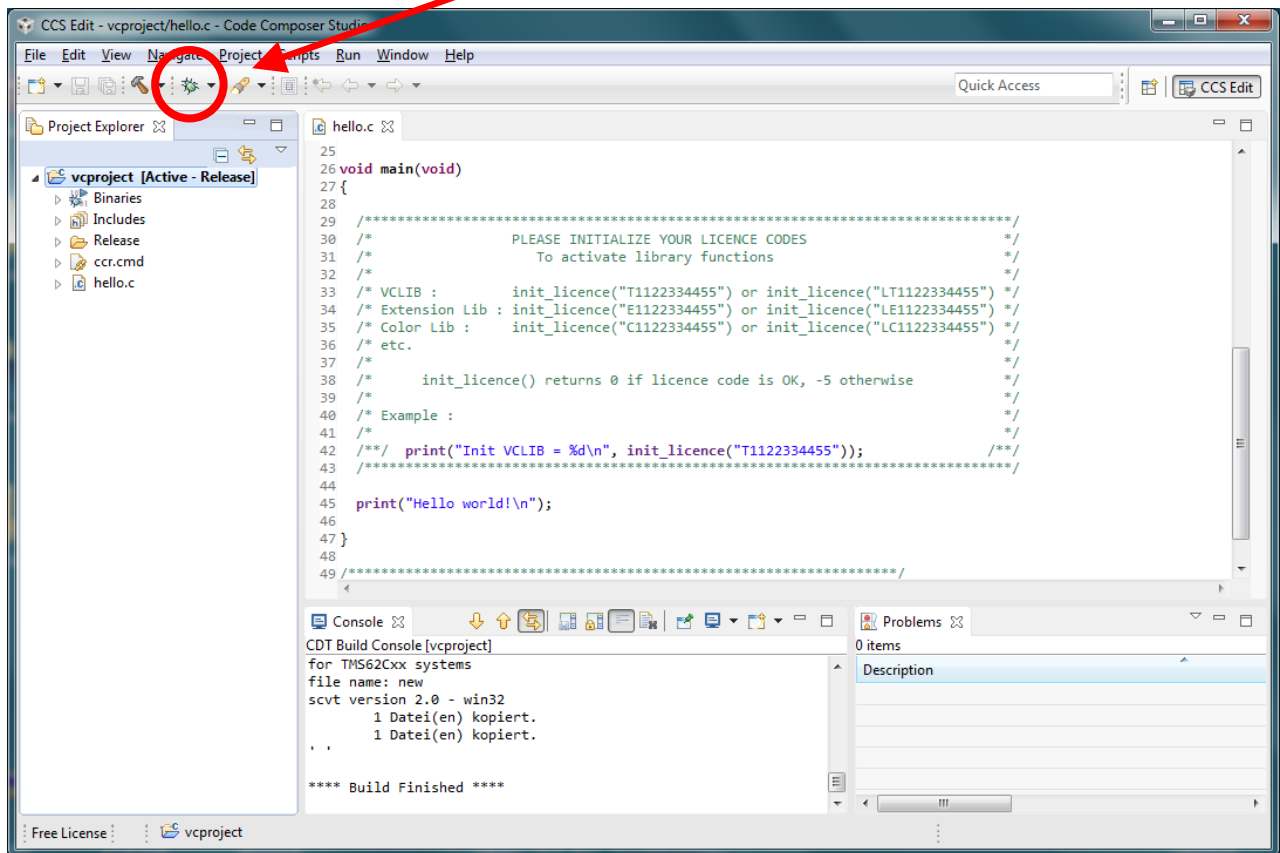
Building a CCS project

4. Note the **licence number initialisation** with the function init_licence(), this is necessary for using the library functions. The warning **">> warning: entry point other than _c_int00 specified"** is normal.

5. The program is compiled and saved in the Send folder under myprojects (in our example **C:\ti\MyProjects\Send**): 2 files (**.out and .msf**) for two types of upload.
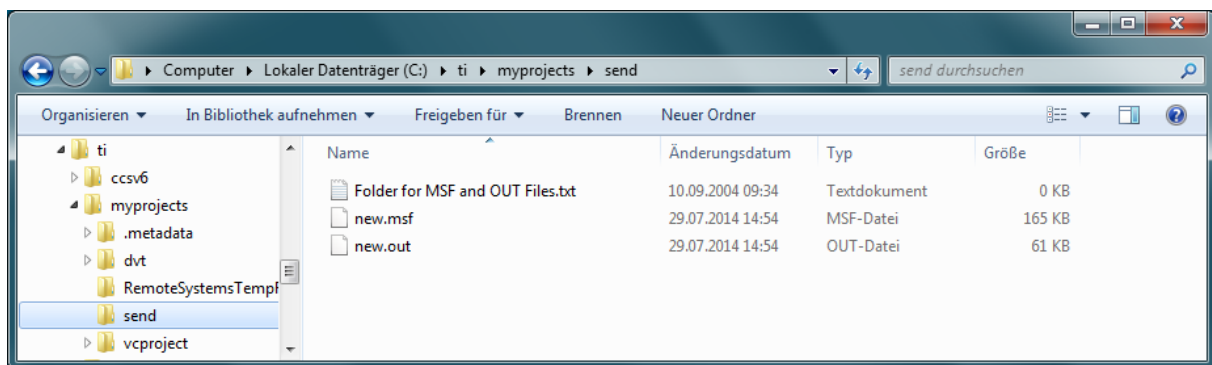
Send folder

6. The executable file can now be uploaded to the camera.

10 Uploading programs on the camera

1. The easiest and fastest way to upload the compiled program (or any file) to the camera is FTP transfer:

2. Connect to the camera with an **FTP client** (for example Total Commander: **http://www.ghisler.com/download.htm**), using the camera IP address and port 21.

⚠ Under **Windows 7**: if the communication does not work, it may be necessary to unblock your FTP client in the Windows firewall!

3. Upload the file (in our example **new.out**) to fd: (flash memory) or md: (SD card).

4. Connect to the camera with the terminal program like in chapter 3 and **execute the program**.

Executing a program

5. **Alternative upload:** execute shell command load **"$lo <Return>"**.

6. In menu "**File-> Send File"** choose the file **"new.msf"** in the send folder **"c:\ti\MyProjects\Send"**.

7. Execute program **"new".**

11 Bonus step: TCP/IP image transfer

VC's most recent smart cameras (e.g. the **VC nano series**) do not have a video output, instead live images must be transferred to a PC via TCP/IP.

1. The image transfer package can be found in the **VC Demo Programs** folder which is installed with the library setup. Or you can download the Image Transfer zip file from the VC website (**http://www.vision-components.com/en/service-support/download-center/software/software-utilities/**).
2. Upload the image transfer program **img2b.out** (TCP/IP server) to the camera using FTP.
3. Install the client program on the PC by registering the ATXControl control in the windows command line with **"regsvr32.exe atxcontrol.ocx"**. On Windows 7 execute cmd.exe with administrator rights!
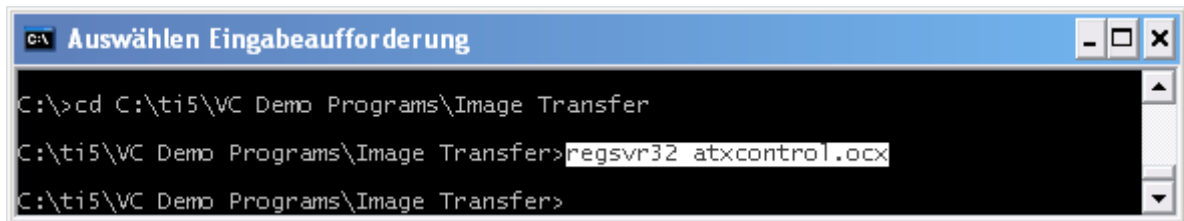
Registering atxcontrol.ocx

4. On the camera, run the program img2b in the background with the command **"img2b &"**.
5. Set the camera in live mode using the command **"vd -l"**.
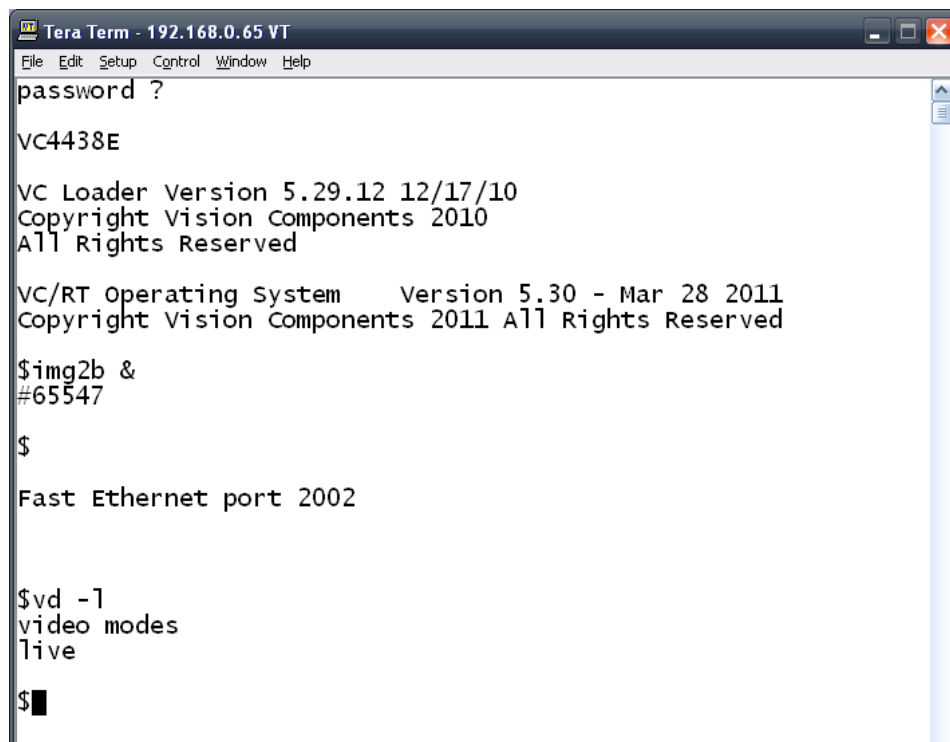
Executing image transfer program in TeraTerm

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6. Start the ATXClient program and enter the correct parameters (IP address of your camera under **Server IP**, resolution under **DX and DY**). Check the box "live mode" to get continuous images.

7. Click on **"Get Image"** to start the image transfer.

The ATXClient program. Parameters set for a full frame on a VC4438E camera.

PART II

ADDITIONAL

INFORMATION

1   Description of the software

1.   TI Code Composer Studio v6 IDE & C/C++ cross compiler

Code Composer Studio (CCS) is a comfortable graphical development platform for programming Vision Components Smart cameras. Following these installation instructions allows quick creation of camera programs based on the predefined project template that already include all settings necessary.

2.   Vision Components VCRT Smart Camera operation system

VCRT is a purpose developed real- time, multi- tasking operating system that fully utilizes the calculation performance of the latest Texas Instrument DSPs.

The main features are:

- Interrupt driven, jitter free background image acquisition (hardware or software triggered)
- Image acquisition, transfer and processing possible in parallel.
- Handling of all camera communication and IOs
- Programmable input and output lookup table
- Memory management for flash, DRAM and MMC / SD
- Shell environment for controlling the main camera functions
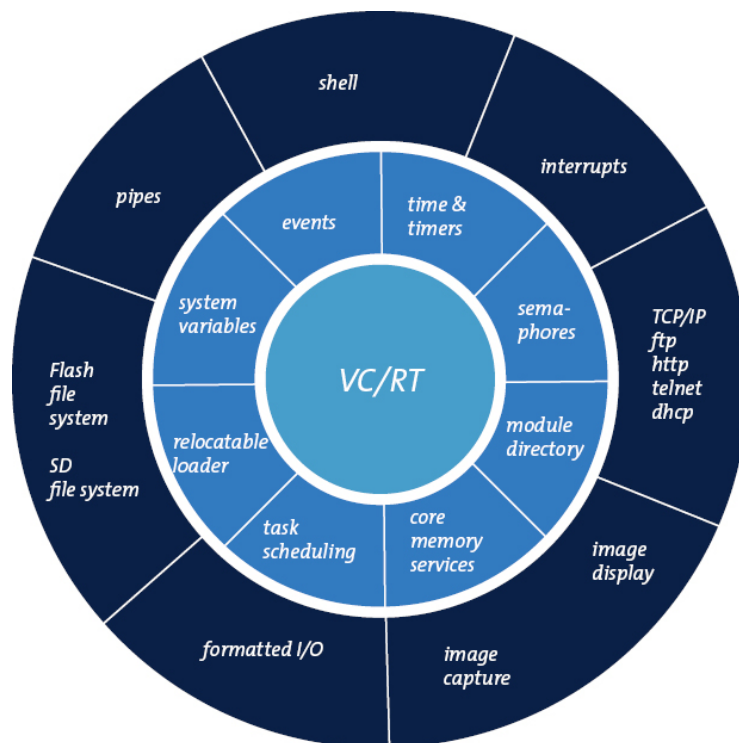
Refer to the VCRT5 documentation for further reference on the VCRT operation system functions.

3. VCRT operation system function library for PC

The VCRT PC library includes all main camera functions that are not image processing functions:
- Image acquisition functions
- Video Control Functions
- Memory allocation functions, DRAM access and flash functions
- IO functions
- RS232 / Telnet functions, TCP/IP functions
- System variables

Included further are a range of utility functions. Refer to the VCRT5 documentation for further reference. This document also details the shell functions available for controlling VC cameras.

4. VCLIB image processing library for PC

The VCLIB includes the extensive range of image processing functions available for VC cameras – for instance:
- Macros simplifying the processing and display of captured images
- Functions for processing grey scale images
- Functions for processing and evaluating binary images
- Graphics functions for adding graphics and text to image or overlay

5. Additional image processing libraries for PC

In addition to the standard VCLIB, VC provides other image processing libraries. See the list in the next chapter.

2 Licensing

1. In addition to the standard license (**VC SDK-TI**, for using VCLIB + VCRT Lib), Vision Components
    also offers special libraries:

    -   VC **Extension Lib** (new Extension Lib with a range of additional functions)
    -   VC **Color Library** (Color Library for Bayer to RGB / HIS conversions and more)
    -   VC **Barcode Reader Library** (1D Barcode Reader Library – different standards)
    -   VC **Smart Reader Library** (ECC 200 Data Matrix Reader Library)
    -   VC **Smart Finder Library** (Contour-based Pattern Matching)
    -   VC **Solar Solution** (Solar Wafer Measurement)
    -   VC **nano 3D Library** (for VC nano 3D triangulation sensor)

    Each library is available for download after registration of a valid license key as described **above**.

2. Vision Components issues two types of licenses:

    -   *License for VC SDK-TI, Extension Lib, Color Lib.* This type of license is without runtime,
        and can be used indefinitely with the library versions your purchased and also with newer
        versions. Vision Components may charge an update fee in case of an important update.

    The following licenses are available:

License Number Prefix	License Type Description
T	Full License of VC SDK-TI (VCRT and VCLib)
LT	Evaluation license, valid for a limited time only

License Number Prefix	License Type Description
C, LC	Full and evaluation Color Lib licenses
E, LE	Full and evaluation Extension Lib licenses

    -   *Single license for Smart Finder, Smart Reader, Barcode Reader, Solar Solution and
        nano 3D library.* In this case a license per camera is needed.

    For each license type, evaluation licenses are also available (fully-featured but time limited).

3. All special libraries require initialization within the camera program code prior to using its
    functions.

4. **Initialization** is done calling the **init_licence()** function using the corresponding license code as shown below:

```
void main(void)
{
    /* Initialize VC Licenses*/

    /* initialization of full VC SDK-TI license*/
    print("Init VCLIB = %d\n", init_licence("T1122334455"));

    /* initialization of an evaluation Color Lib License */
    print("Init VCLIB = %d\n", init_licence("LC1122334455"));
}
```

Function description (also refer to Color_Lib.pdf - Color library for VC cameras Version 3.0):

init_licence   **initialize license code**

synopsis   I32 init_licence (char *code)

Please always check the return value of the function init_licence: the function returns 0 if the licence is valid, -5 if the licence is not valid.

Checking the return value is important: if the licence if not valid, some functions simply will not work, without any error message.

5. **Single licenses** (Smart Reader, Smart Finder and Solar Solution) are under the form of **two codes** which have to be initialized in the source code. Refer to the documentation of the libraries.

3   Description of the CCS settings and compiler options

This section describes the compiler and linker options necessary for compilation. Note that the illustrations correspond to the CG Tools version 6.0.28 or 6.0.31. For versions 6.1.x for example the menu items will differ but the necessary settings stay the same.

Note: the paths used in the template project file (for example include and lib folders) use the CCS macros (for example "${CCS_INSTALL_ROOT}" for the install folder, etc.), to make compilation independent from the CCS and VC libraries install folder.

3.1   General settings

Right-click on the project and choose "Build Options...". Click on "General" in the left column. For compilation with a VC4XXX or VC64XX camera, the following general settings are needed:

- Device Variant: Generic C64XX device
- Compiler version: version 6.0.31 (if the version doesn't appear in the list, click on "More…" and in the dialog indicate the CGTools installation folder)
- Linker command file: ccr.cmd
- Runtime Support Library: from VCRT 5.29, the rts6400.lib is supported for compilation with C64xx processors. But as it's already linked in the linker command file (ccr.cmd), the field has to be empty!
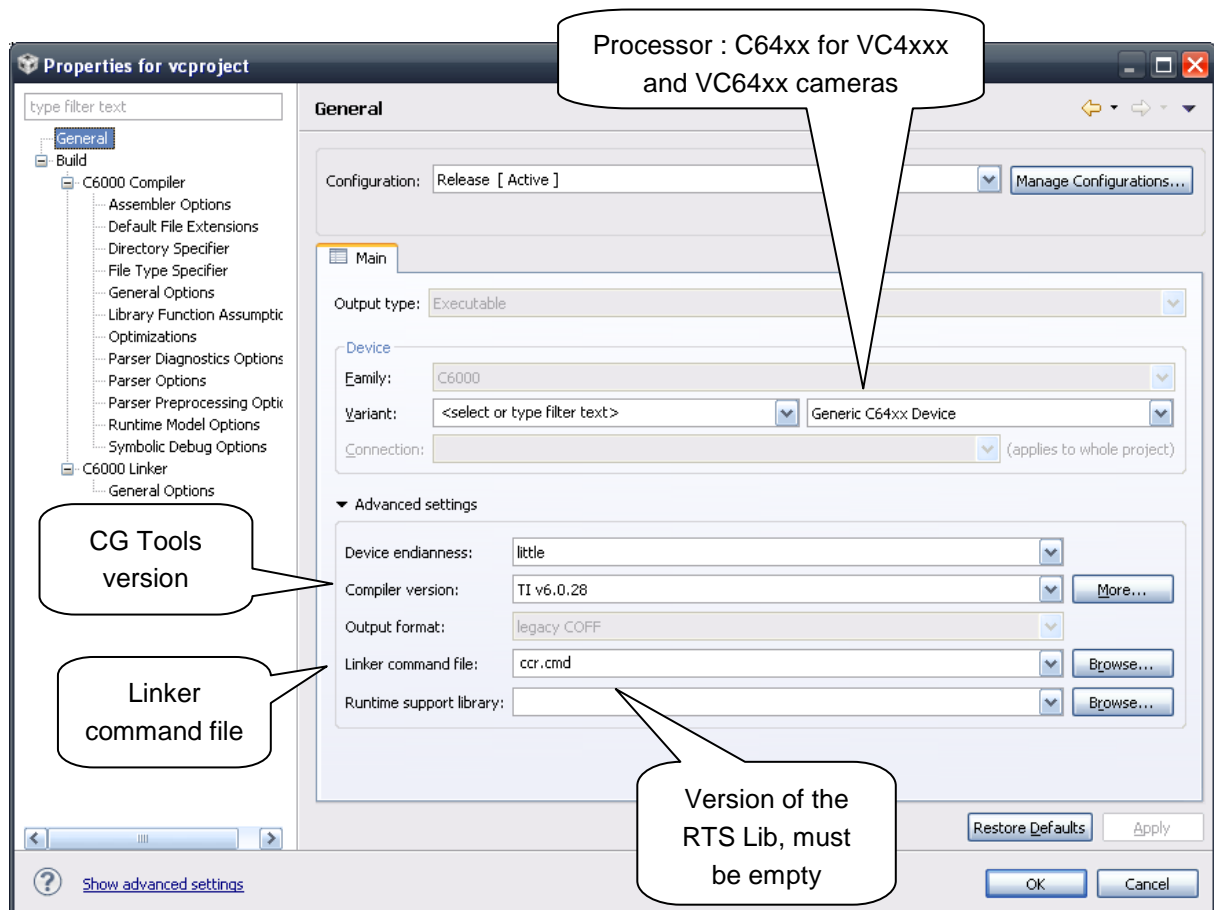
3.2   Compiler settings

The most important compiler settings are:
- include file search paths
- interrupt threshold: The advanced compiler setting "-mi100000" sets the interrupt threshold to 100,000 cycles, defining the maximum frequency interrupts are queried. Omitting this setting can speed up some functions significantly. However in this case it is important to ensure that inner loops perform less than 100,000 cycles, as interrupts (e.g. timer) can be out of sync otherwise. The "**Code Optimization**" document, part of the "Advanced Programming Seminar" covers the speed optimization of programs in detail.

3.3   Linker settings

The most important linker settings are:
- relocatable output module: relocatable code is now standard, it brings more comfort for the user because VCRT manages program loading in memory automatically (whereas with absolute linked code, memory address of the program has to be taken care of). For more information have a look at the VC Programming Tutorial
- library search paths
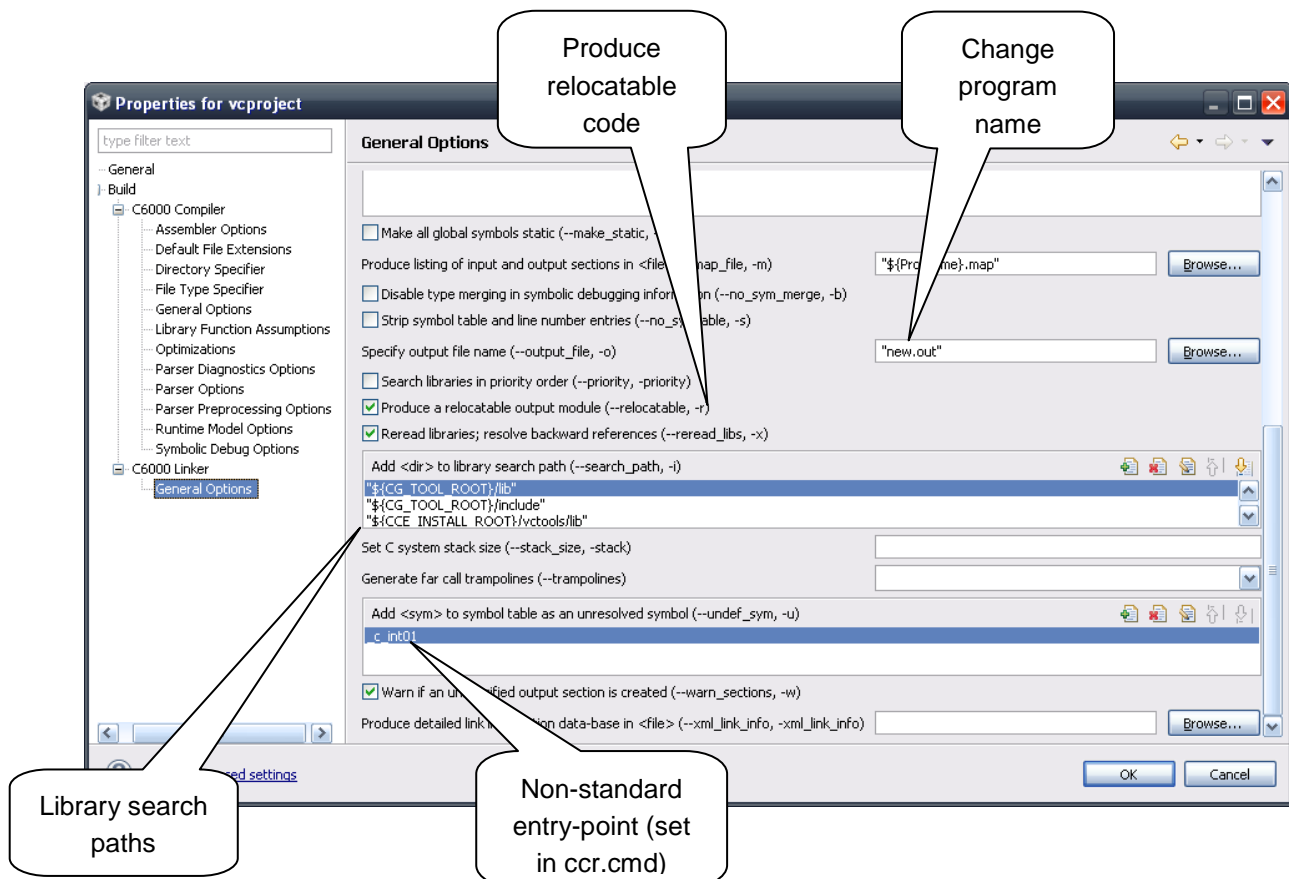
3.4 Final build steps

After compilation a batch file is executed:

```
rem Remove debug info
strip6x %1.out

rem create .msf file
copy %1.out exec.out
%2\vctools\util\econv32 %1
%2\vctools\util\scvt32

rem copy .out and .msf file to send folder
copy adsp.msf %3\send\%1.msf
copy %1.out %3\send\%1.out

del adsp.*
```

The first line: **strip6x new.out** removes debugging information from the executable code and makes the file smaller.

The next lines **convert the executable *.out" file into an *.msf file** for serial and Telnet upload.

Both executable files – *.msf and *.out files are copied to the send folder.

All redundant files are deleted from the project directory.
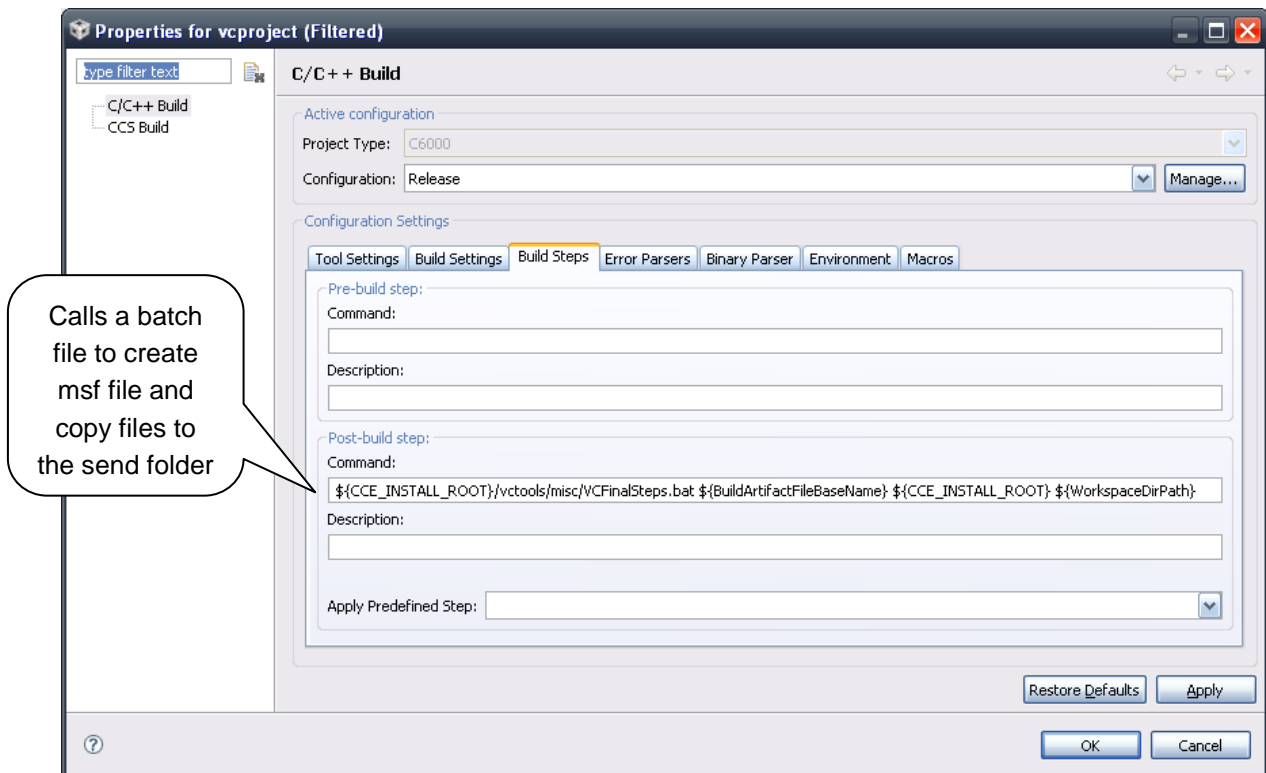
3.5 Compiling other source files

To create a new source file:

- right-click on the project, and choose New → Source File. Name it and confirm. The new source file appears in the project tree.

To compile another existing source file:

- right-click on the source file (in the first example hello.c) and choose "Delete"
- then right-click on the project, choose "Add Files…" and select your new source file. CCS will copy it automatically to your project folder.

3.6 Creating new projects

To create new projects without losing the compiling options for VC cameras, simply copy the original project **vcproject**:

- right-click on the project and choose "Copy"
- right-click on the blank space in the left column and choose "Paste"
- in the dialog box, give your new project a name, and confirm with OK

the new project is created and is available in the "Project Explorer" column.

4 The camera file system(s)

1. All VC Smart Cameras feature a flash EPROM as non volatile program and data storage media (4 to 32 MB). VC4XXX cameras with video output also incorporate a 2 GB SD card as extended data storage

2. The following overview highlights the file handling differences between flash and MMC / SD:

Flash EPROM	MMC / SD
- Does not support standard file extensions! The following files types are supported and automatically converted into numerical file extensions (FTP transfer): - exe → 000 - asc → 001 (also: asc, htm, html, txt from VCRT 5.25) - dat → 002 - jpg → 003 - binary → 231 This extension is also displayed if one of the file types above is not recognized (adjust file extensions on PC in this case).	- Does support standard file extensions
- EPROM required packing in order to free memory after file deletion.	- MMC and SD are self organizing, i.e. packing after deletion not required.
- it is not possible to create subdirectories	- Creation of subdirectories possible - $mkdir md:/subdir
- Faster access	- Slower access
- Protected first flash EPROM sector: fd:/sys/ Accessible with "$dir –x" - Working directory: fd:/user	- No subdirectories - Path: md:/
- File upload per Telnet/ RS232 /FTP possible	- File upload only per FTP possible
- Only *.msf file upload	- Upload of standard file types (no *.msf)
- Default directory for program execution	- Executing programs from MMC possible after calling : $cx md: (back: $cx fd:)

3. When deleting a file from the flash EPROM using the command "del", the file is not physically erased. It is also the case when uploading several times a file with the same name to the camera: the file will not be overwritten but will use more space. The deleted files are visible when using the shell command **"$dir -a"**.

Example: shell command "dir –a"

4. This means that the flash EPROM sometimes gets full. To release the space occupied by these "ghost" files, packing is required, with the shell command **"$pk"** (can last up to a few minutes).

Shell command "dir –a" after packing

In summer 2013 VC cameras will get a new flash file system which does not require packing anymore. Check the support news.

5 Setting the camera IP address: the #IP file

1. The camera IP address is changed by uploading a #IP file into the camera memory. This is an
    ASCII file containing the IP address settings.

2. The **default IP address** of all Vision Components Smart Cameras is **192.168.0.65**

3. In order to operate more than one camera on a network, each camera requires an individual IP
    address. Changing the IP address of a camera is done the following way:
    -   Create a text file named **"#IP.txt"**
    -   Edit the file and type in the desired IP address (**RETURN at the end of every line required!**).
        For example:

#IP file entry:	Explanation
IP: 192.168.0.81↵	New camera IP address – change at next start up
MSK: 255.255.0.0↵	Mask for setting the IP address subgroup
GTW: 192.168.0.1↵	Specify gateway if required
DHCP↵	Adding "DHCP" to the "#IP"- file requests the IP address allocation from the DHCP server. In case DHCP allocation is not possible, the camera is set to the IP address specified in the first line. If no other IP address is specified in this file, the camera is set to its default IP address: 192.168.0.65
PWD: mypassword↵	It is possible to protect the access to the camera with a password. The password set in the #IP file will be asked for both Telnet and FTP connections to the camera (for FTP: username is don't care)
NS1: 192.168.0.1↵ NS2: 192.168.0.2↵	NS1 and NS2 are the IP addresses of DNS servers. When these (or at least one) are available in the #IP file, VCRT automatically starts the DNS resolver at startup and allows to use the name resolving functions.

    -   **Upload the file** to the camera (**important: to fd:**) using FTP.

4. The new IP address is displayed on the monitor connected to the camera for a few seconds at
    every power up. The file is displayed as **"#IP.001"** in the camera memory (flash EPROM).
    Deleting this file resets the camera to its standard IP address of 192.168.0.65 at next start up.

    You can check the #IP file at the camera shell with the command: $type #IP
    It is advised to perform this #IP file check prior to re- booting the camera!

6 Starting your application automatically: the autoexec file

These are the steps for generating an autoexec file:

1. Create a text file called **"autoexec.txt"** – Make sure that a Return (CR + LF) is inserted at the end of each line. The command in that line will not be executed otherwise! This is often the reason why programs are not executed.

2. Type in the commands and don't forget the RETURN after every command

   for example:

   sh 10000   /*sets the shutter speed to 10ms*/
   img2b &   /*starts a background program with lower priority
   myprog   /*starts the program "myprog" previously uploaded into the camera EPROM*/

3. Upload the autoexec.txt file to the camera (**important: to fd:**) using FTP.

The camera now starts the commands inside the autoexec file after every power up.

You can check the content of your autoexec file at the camera shell with the command: **$type autoexec**.

7 IP address forgotten, autoexec running: recovering the camera

The **VCnet Recovery Tool** is provided for

- **resetting the IP address** of the VC cameras
- **preventing the execution** of the **autoexec** file.

In order to use the VCnet Recovery tool, follow the steps below:

1. Download and install **Java** on your PC.

2. Download **VCnet Recovery Tool** from **www.vision–components.com** or look in your install folder under **vctools\util**

3. If downloaded, unpack the "vcnet14.zip" folder a directory on your harddrive (for instance C:\ti\Util…).

4. Open the Dos command line window and change to the directory containing "vcnet.jar".

5. Execute the following command from the DOS Window "vcnet.bat 5912345" , by specifying the camera serial number as shown. This command sends vcp packets via UDP broadcast for the next 15 seconds. **Sending this command resets the corresponding camera to the default IP address and bypasses Autoexec execution.**

6. Boot the corresponding camera (power on) during the next 15 seconds. During start up the camera listens 0.5 seconds for vcp packets send with vcnet.jar.

7. If a valid vcp packet is received from camera an answer packet is sent (see example below). The camera continues booting in standard configuration:

Default IP address:	192.168.0.65
Mask:	255.255.255.0
Gateway:	none

Note:

→ An autoexec file residing in flash memory is not executed when VCnet is called!

→ The IP reset and auto exec bypass **is only temporary**! In order to change the IP address or autoexec, the corresponding file needs to be changed.

→ The timeout for receiving packets is set to 15 seconds after start of VCnet.

→ Since UDP is not a "fail safe" protocol, execution of VCNet may not work at the first time. Repeat calling VCNet if necessary.

A full description of the VCnet tool can be found in the corresponding ReadMe File.

8 Communication troubleshooting

1. Connect the Camera directly to the PC using the cross link cable and adapter as shown in the installation document (or connect via Hub to the PC).

2. Make sure your PC network connection is set to the same subnet as the camera (i.e. 192.168.0.XXX, mask: 255.255.255.0 – refer to **chapter 4** of part I).

3. Turn off "automatic allocation of IP address" as described in **chapter 4** of part I.

4. Turn off any fire wall on your PC.

5. check with "arp –a" at the DOS input window (under accessories) if there are any entries for the camera's IP you are using – e.g. 192.168.0.65. If so, delete that arp entry at the DOS prompt with the following command: "arp –d 192.168.0.65" (calling arp –d without parameter deletes all arp entries). This step is not required after VCRT 5.26 camera OS!

6. Re check with "arp-a" if the arp entry for that IP address has been deleted successfully.

7. Check if the IP address is already in use in your network (for instance with "ping 192.168.0.65"). (in that case you get a message "goodbye" and the connection shuts down). If so, disconnect your PC from your network and connect straight to the camera using the cross link cable and change the camera IP address as shown in **chapter 5** of part II.
    From VCRT 5.26 it is possible to take over an existing Telnet session.

8. Re- start the camera (power up). Confirm that the camera IP address is still the default address (192.168.0.65) – check at startup the video output of camera. Wait until a live image is displayed on the VGA output.

9. Install and start TeraTerm (with Administrator rights on your PC), Refer to **chapter 5** of part I. Adjust TCP/IP settings as shown.

10. if the welcome prompt is not displayed, please shut down TeraTerm, reboot the camera and try again to re- establish a connection.(Usually the connection works at the very first attempt, but sometimes a camera re- boot may be required).

11. Try to connect to the camera using the VCNet tool (see chapter 10.5.1.2).

12. if still no connection can be achieved, check all cables (swap with another set of cables if possible). Check correct pin allocation for self made connections.

Besuchen Sie die Webseite von Vision Components **www.vision-components.com** für weiterführende Informationen, Dokumentationen und Software Downloads:

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