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Wireless Technology, Inc.

DTC-720
Desktop Keyboard
Controller

Installation and
Operation Manual

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FCC NOTICE

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

- 1.) This device may not cause harmful interference, and
- 2.) This device must accept any interference that may be received, including interference that may cause undesired operation.

IC NOTICE

This device complies with the RSS-210 Industry Canada.

Operation is subject to the following two conditions:

- 1.) This device may not cause interference, and
- 2.) This device must accept any interference, including interference that may cause undesired operation.

READ THIS MANUAL

Every effort has been made to insure that this WTI system is of the highest quality. This product has been carefully inspected to comply with rigid quality standards before shipment to you. In consideration of your investment and the desire to obtain full performance capability engineered into your new WTI product, we recommend that you read this manual before attempting to operate your system.

FOR MORE ASSISTANCE OR MORE INFORMATION

WTI (Wireless Technology, Inc.)
2064 Eastman Avenue, Suite 113
Ventura, CA 93003-7787

TEL 805/339-9696 TOLL FREE 866/gotowti (468.6985)
FAX 805/339-0932

EMAIL: sales@wirelesstech.com

INTERNET: <http://www.gotowti.com> or <http://www.wirelesstech.com>

The software/firmware furnished with the equipment is confidential to and is copyrighted by WTI (*Wireless Technology, Inc.*) It is not to be copied or disclosed in any manner without the consent of WTI (*Wireless Technology, Inc.*) The software/firmware is furnished to the purchaser under a license for use on a single system.

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PRODUCT WARRANTY

PRODUCT WARRANTY

We appreciate your purchase of *Wireless Technology, Inc.* (WTI) security products. We take pride in the quality of our products and have manufactured each new WTI product to exacting quality standards. In normal use, it will provide you with years of satisfactory performance. However, should you experience difficulty; you are protected under the provisions of this warranty.

WTI warrants to the original user a product that is free of defects in materials and workmanship in normal use. WTI warrants to the original user that WTI's products will be free of defects in materials and workmanship in normal use for a period of 12 months from the date of sale. WTI's obligation under this warranty shall be limited to the repair, including all necessary parts and the cost of labor connected therewith, or at our option, the replacement of any product that shows evidence of a manufacturing defect within the warranty period.

This warranty is extended to all WTI products purchased and used within the United States of America and is valid only when service is rendered by the authorized WTI (*Wireless Technology, Inc.*) Warranty Station.

This warranty shall not apply to appearance or accessory items including, but not limited to, knobs, connectors, cabinets and connecting cables. This warranty shall not, in addition, apply to repairs or replacements necessitated by any cause beyond the control of WTI including, but not limited to, acts of nature, improper installation, misuse, lack of proper maintenance, accident, voltage fluctuations, unauthorized repairs or modifications.

This warranty becomes void in the event serial numbers are altered, defaced or removed, or an attempt is made to field service or alter performance of any WTI products.

WTI reserves the right to make changes in design, or to make additions to, or improvements upon, products without incurring any obligation to install the same on products previously manufactured.

The foregoing is in lieu of all other warranties expressed or implied and WTI neither assumes nor authorizes any person to assume for it any other obligation or liability in connection with the sale of our products. In no event shall WTI or its Authorized Dealers be liable for special or consequential damage arising from the use of this product, or any delay in the performance of this warranty due to causes beyond its control.

REPAIRS & RETURNS

REPAIR AUTHORIZATION

Please contact WTI (*Wireless Technology, Inc.*), to obtain a repair authorization number (RA) and provide the following information:

- 1.) Product Model & Serial Numbers.
- 2.) Date of shipment, purchase order number, sales order number or WTI invoice number.
- 3.) Details of the defect or malfunction. If there is a dispute regarding the warranty or product, which does not fall under the warranty conditions stated within the description of the written warranty, please include a written explanation with the product when returned.

SHIP FREIGHT PRE-PAID TO:

WTI (*Wireless Technology, Inc.*)
2064 Eastman Avenue, Suite 113
Ventura, CA 93003-7787
U.S.A.

TEL 805/339-9696
FAX 805/339-0932

RETURNS

No unauthorized returns will be accepted. All returns must have an authorized (RA) number issued by the factory (CA number if returned for credit and RA number if returned for repair). Products returned for repair or credit will be rejected if no authorization number has been issued or freight has not been pre-paid. All merchandise returned for credit will be subject to a 20% restocking and refurbishing charge.

IMPORTANT SAFEGUARDS

IMPORTANT SAFEGUARDS

- 1.) Read and follow these instructions. It is important to read all safety and operating instructions before installing or using this equipment.
- 2.) Retain Instructions. Retain this manual and any supplements for future reference.
- 3.) Prevent all liquids or other material from entering the keyboard housing. Protect the unit against extremes of vibration, pressure or dampness while transporting unit.
- 4.) When connecting the power source, please follow all electric safety standards and only use the power supply designated for this device. The keyboard controller's RS-485 signals use TVS technology to protect them from strong electrical surges. This technology prevents damage to the device resulting from impulse signals such as lightning strikes or surges of power. Allow for enough distance between the RS-485 signals and high-voltage equipment or cables during the transmission process. Please do not power the unit until all connections are secure and installation is complete.
- 5.) To reduce the risk of electric shock or equipment damage, work on the unit only when the power is shut off and is unplugged from its power source to prevent accidental activation. Also take precautions to avoid contact between the equipment and other electrical wires or power sources that may be present at the installation site.
- 6.) Heed warnings. Adhere to all warnings on the equipment, and in this manual.
- 7.) Wear proper safety gear when installing, servicing or removing any equipment. Including, but not limited to, safety goggles, gloves, proper work shoes, ear plugs or covers, hard hats and safety lines. Always strive to be as safe as possible while working with electronic equipment.

Do not attempt to open the sealed keyboard assembly. There are no user-serviceable parts inside. Refer servicing to the WTI (*Wireless Technology, Inc.*) factory service center only.

THE DTC-720 DESKTOP KEYBOARD CONTROLLER

The DTC-720 is a multi-function desktop controller designed for setup and programming of the Sidewinder Series and other WTI P/T/Z cameras.

Features of the DTC-720 include:

- Three (3) axis proportional joystick for precise control of pan, tilt and zoom functions.
- Bright OLED display for readability in any lighting conditions.
- Provides simple setup of presets and tour functions.
- Supports field firmware upgrades of the Sidewinder and the DTC-720.
- Supports basic, extended and advanced Pelco D and P codes.

Communication between the desktop controller and the cameras is established by means of an RS-485 interface. The desktop controller receives all responses from the cameras and displays these in plain text or hex code. Current is supplied via a 120VAC to 12VAC or 12VDC transformer.

Updates for the desktop controller can be imported via the RS-485 interface using a PC and terminal software.

There is also the possibility of importing new firmware versions for Sidewinder cameras. Individual texts can be created for presets. For tours, the dwell time can be set for the individual presets. All other commands can be tested and the Sidewinder responses displayed. The Joystick and the keypad enables Pan, Tilt, Zoom and Focus control.



FORMAT OF THE DESKTOP CONTROLLER PROTOCOLS

Data length	8 bits
Stop bit	1 bit
Parity	None
Baud rate	2400 / 4800 / 9600 / 19200
Control	None
Control Protocols	Pelco D, Pelco P
Update Protocol	XModem (128Byte/CRC-Mode/Checksum-Mode)

The 2400, 4800 and 9600 baud rates are used to control the Sidewinder cameras. These Baud Rates can be used with the Pelco D or Pelco P Codes.

The 19,200 Baud is only used for updating of the desktop controller firmware or loading Sidewinder firmware into the desktop controller for field updates. Updates of the desktop controller firmware use the RS485 camera control interface. Firmware updates may also be done at lower baud rates if long cables require a lower speed connection to the controller or camera.

PIN ASSIGNMENTS FOR THE CONNECTORS

RS485 interface RJ45 male:

PIN	Description	
1	Rx+ Data (RS-485 input)	Connect to camera / controller*
2	Rx- Data (RS-485 input)	Connect to camera / controller*
3	Not Connected	
4	Ground	
5	12V AC / DC	Voltage input AC or DC
6	12V AC / DC	Voltage input AC or DC
7	Tx- Data (RS-485 output)	Connect to camera / controller*
8	Tx+ Data (RS-485 output)	Connect to camera / controller*

*The RS-485 transmit and receive signal lines are used for communication with the Sidewinder cameras, for uploading new firmware to the desktop controller from a PC and for monitoring RS-485 data communications for troubleshooting purposes.

STRUCTURE OF THE DTC-720 SIDEWINDER P/D PROTOCOL

Communication normally takes place in the Sidewinder P-D protocol (extension of the Pelco-D code). The “Pelco-D protocol” has been extended in order to make use of additional functions provided by the Sidewinder. The format for controlling the Sidewinder is as follows:

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Synch Byte	Address	Command 1	Command 2	Data 1	Data 2	Check Sum

For an exact description, see “Software protocol Sidewinder P-D”.

For updating the DTC-720 or the Sidewinder, or for the control of the camera, a selection can be made via the described menus below.

FACTORY DEFAULT SETTINGS

The following settings are factory settings. If you change the settings the DTC-720 will store the new value in the EEPROM:

	Default	Selection
Show Alarm	Off	On/Off
Pelco Code*	Pelco D-Code	Pelco D-Code / 2400 Baud
Pelco Code*	Pelco P-Code	Pelco P-Code / 4800 Baud
Baud Rate primary port	2.400 Baud	2.400, 4.800, 9.600, 19.200, 38.400, 57.600
Baud Rate for uploading firmware from PC	19.200 Baud	2.400, 4.800, 9.600, 19.200, 38.400, 57.600
Termination input	Off	On/Off
Termination output	Off	On/Off
Repetition Time	500 milliseconds	400 ... 9999
Response	Off	On/Off
Show position	Off	On/Off
Tour dwell time	10 seconds	1 ... 255
AI functions	Off	On/Off

*The Baud Rate always changes to the default rate after switching between Pelco D-Code and Pelco P-Code. To use a non-standard baud rate, change the Baud Rate after changing the Code.

The following settings may be changed but the changes are lost after switching off the DTC-720:

	Default	Selection
Preset Text	Preset	
Panning Speed	46	1 ... 64

CONNECTING THE CONTROLLER

CONNECTING THE DTC-720

A standard Ethernet RJ45 patch cable is used to connect the DTC-720 to terminal block enclosure included with the unit. At a minimum, the power and TX+/TX- signals must be connected to use the DTC-720 to control the Sidewinder camera. The RX+/RX- signals must also be connected to the Sidewinder camera to support firmware uploads and query commands, like the position display.

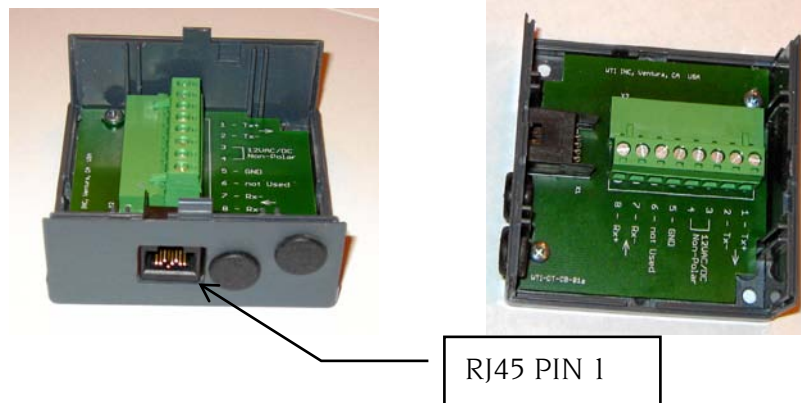


Figure 1: Junction Box

DIRECT CONTROL

After switching on, all important functions can be executed directly with the DTC-720.



RJ45 Jack pinouts

PIN	Description	PIN	Description
1	Rx+ Data (RS-485 input)	5	12V AC/ DC
2	Rx- Data (RS-485 input)	6	12V AC/ DC
3	not connected	7	Tx- Data (RS-485 output)
4	Ground	8	Tx+ Data (RS-485 output)

RJ45 PIN 1

Figure 2: DTC-720 Rear Panel

CONTROLLER FUNCTIONS



Figure 3: DTC-720 Front View

The selected Device Address to be sent along with the commands is shown in the display. In the lower part of the display, numerical inputs entered from the keyboard below are displayed before they are sent to the camera.

Moving the camera: With the Joystick you can move the camera to the desired position. To increase the speed of movement, move the joystick further from center.

Change Focus / Iris / Zoom: Pressing one of the focus or iris keys changes the camera mode from AUTO to MANUAL and adjusts the camera function. Moving the camera with the joystick restores the camera function to the AUTO mode again. Twisting the joystick knob clockwise zooms the camera in. Twisting the joystick knob counter-clockwise zooms the camera out. The Zoom and Focus speed can be adjusted using the "special internal menu" "command list".

GoTo Preset / Set Preset: To call a preset, input the preset number and briefly press the "PRESET" key to send the GoToPreset command to the camera. To set a new position for a preset, press the key for more than 3 seconds, and the command Set Preset will be sent. The preset text that is displayed on screen must be entered using the "Preset Text" menu prior to setting the new preset position.

Set Tour / Start Tour / Panning: To start a Tour you must input the tour number and briefly press the "TOUR" key. To create or modify a tour, enter the tour number and press the "TOUR" key longer than 3 seconds. Then call each of the presets that you would like to include in the tour. When you have called the last preset for the tour, press the "Enter" button. The default dwell time for a tour preset is 10 seconds. If you would like to use another dwell time you must change this using the menu "dwell time" feature first. A special type of tour is available if only two presets are selected. This "panning tour" will pan back and forth between the two presets selected. Any tour number can be set to be a panning tour by choosing exactly two presets for the tour. The panning speed is adjusted using the "Panning Speed" menu option. The default value is 46.

CONTROLLER FUNCTIONS

Special functions / System settings: If you briefly press the FUNC button you invoke the menu system. Here you can change settings, configure the DTC-720 and upload firmware.

NOTE: The Joystick does not function when the menu functions are active. Navigation of the menus is controlled by the "FOCUS-Near" key (up) and the "IRIS-Open" key (down). To confirm your selections press the ENTER key.

Reset settings to factory default / Password reset: If you switch the power off and on again the DTC-720 shows the version of the installed firmware. While the firmware version is displayed in the window, you may press the TOUR key or the PRESET key to select a reset function.

Pressing the TOUR key: If you press the TOUR key after power-on-reset you can select a reset of the EEPROM to factory defaults. This resets all internal settings, except the password.

Pressing the PRESET key: If you press the PRESET key after power-on-reset, the password is reset to the factory default password.

MEANING OF THE FUNCTION MENUS

Preset text: This menu item enables presets to be adjusted. Text and other preset adjustments may be made. It is also possible to move the camera to the desired position.

Tour Functions: This menu enables the tour Dwell time and panning speed to be set.

Update Device: This menu includes functions for the loading of new firmware to the DTC-720 and for updating the Sidewinder camera and other WTI devices.

Special Functions: Here you can choose the special function Presets of the Sidewinder from a list of text.

System: This menu includes the functions for modifying the communication settings for the handheld controller.

From any submenu, navigate back to the previous menu by pressing the "FUNC" key.

PRESET TEXT

This menu function is used to set the custom text for each preset. The text entered will be assigned to the next preset that you set with the DTC-720. This text is limited to twelve characters (depending on the Sidewinder firmware).

To navigate the cursor and edit the text you can use the joystick (up; down; left and right) or use the following keys:

Up	FOCUS-near key
Down	IRIS-open key
Left Side	CAM key
Right Side	PRESET key

If you edit the text and you set the PRESET by pressing the PRESET key longer than 3 seconds, the DTC-720 will automatically update the preset text, otherwise the DTC-720 will use the default "PRESET X" text to title the preset.

When you set custom text for a preset the DTC-720 first sends "Clear Preset" command, then each individual text character, and then the "Set Preset" command.

After sending the "Set Preset" command, or switching off the DTC-720, the text is set back to the default.

To exit the text editing mode, press the FUNC key.

TOUR FUNCTIONS

Tour Dwell Times

This menu function allows you to set individual dwell times for each preset in a tour. The dwell time may be set from 1 to 255 seconds for each preset. You must set the time before you set the preset. The modified preset dwell time will remain in effect until it is changed, or the DTC-720 is switched off. The default dwell time value is 10 seconds.

Panning Speed

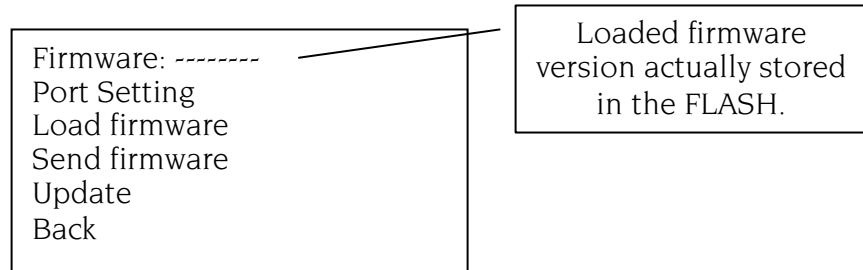
This menu function allows you to set the speed for the AutoPan preset function. All tours with exactly two Presets are interpreted as AutoPan Tours. The default panning speed for AutoPan tours is 46. The value may be set from 1 to 64. The speed should be set before creating the AutoPan tour.

Pressing "FUNC" enables the previous menu to be accessed.

UPDATING THE DTC-720 FIRMWARE

This menu item enables new firmware for Sidewinder cameras to be loaded into the handheld controller and a subsequent update of the camera to be carried out. The new firmware version is initially loaded into the DTC-720 controller via a PC. It is then possible to upload the software into the cameras.

The first line gives the version number of the firmware loaded in the DTC-720 controller.



Update Mode Port Settings

The desktop controller has one RS-485 interface that is used for all of the communication functions. This menu selection allows you to set the primary interface baud rate for the firmware uploading feature. The baud rate should be set to the communication baud rate of the device to be updated, to allow the DTC-720 to send the “remote reset” command to start the upload process. After the reset command to the device is issued, the upload process automatically switches over to 19.200 Baud to speed up the upload process.

The PC Upload-Port baud rate should normally be set to 19,200 baud, and should match the setting that you use in the terminal software installed on the PC that you will use for loading the firmware. For the firmware upload, you will need to use terminal software with X-Modem transfer protocol support.

The PC Upload-Port baud rate setting is stored in the internal EEPROM and reloaded when the device is restarted.

Load Firmware From A PC

This menu selection loads a new version of the Sidewinder firmware into the handheld controller. For the upload the controller uses the RS-485 interface. The desired baud rate for the upload needs to be set. The firmware must be sent from a PC to the DTC-720 desktop controller using a suitable terminal software program like Microsoft Windows HyperTerminal Version 5.1 that supports XModem protocol. The data received is saved in the internal FLASH of the desktop controller and is now available for a subsequent update of the Sidewinder cameras or other devices. The firmware file to be uploaded should have a “.WTI” suffix and is stored in an encrypted form on the PC and in the desktop controller for security purposes.

The conditions for the transfer are:

Data length	8 bits
Stop bit	1 bit
Parity	None
Baud Rate	19.2K Baud (default)
Control	XModem (CRC / Checksum)

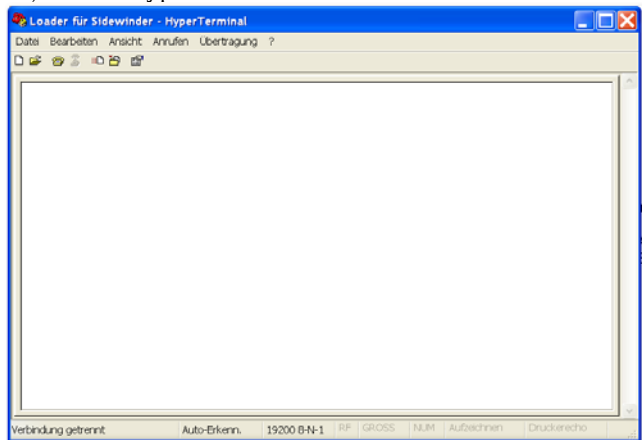
The default 19,200 baud rate may be changed, but should normally work fine in almost all situations.

For data transfer from a PC to the DTC-720 use a suitable terminal software program like Microsoft Windows HyperTerminal Version 5.1 that supports XModem protocol (as in following illustrations).

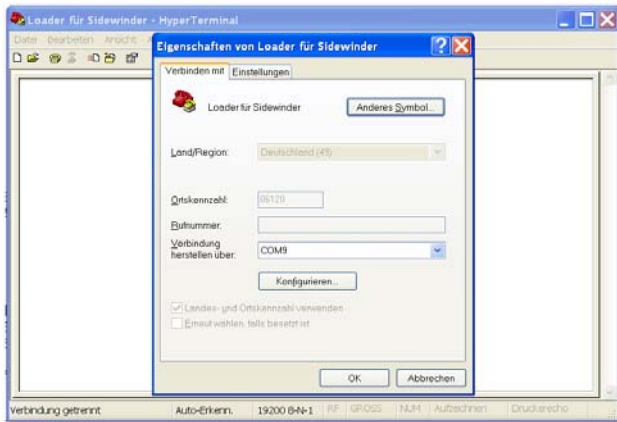
For example, using HyperTerminal Version 5.1:

On the DTC-720 choose "Update Device." If necessary you must change the Baud Rate. The interface used for the download from PC to the DTC-720 is RS485.

1.) Start HyperTerminal

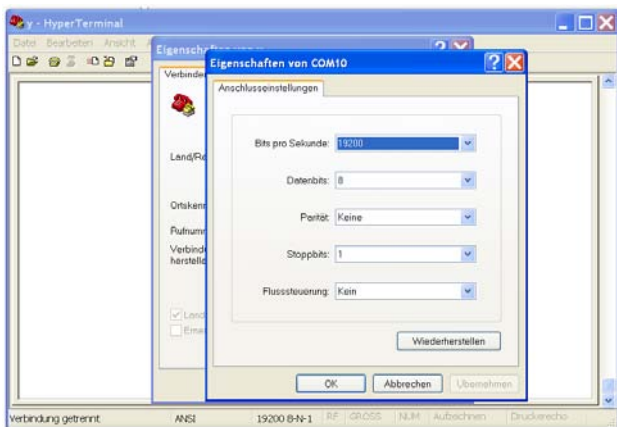


2.) Select the serial COM port connected to the DTC-720 (here COM9).



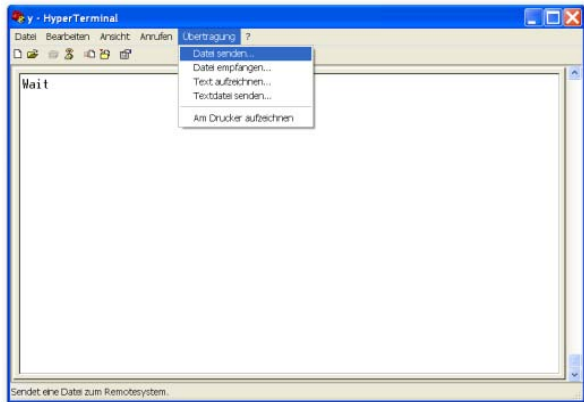
3.) Set the connection parameters to:

Data length	8 bits
Stop bit	1 bit
Parity	None
Baud Rate	19.2K Baud (default)
Control	none (transfer will be controlled by XModem)

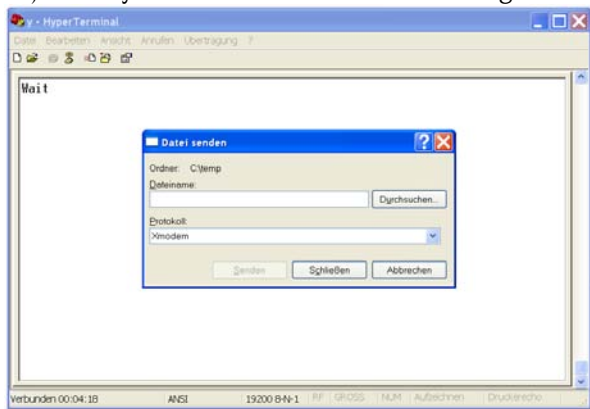


Now you must send the *.WTI file to the device.

1.) Select transmit – send file.



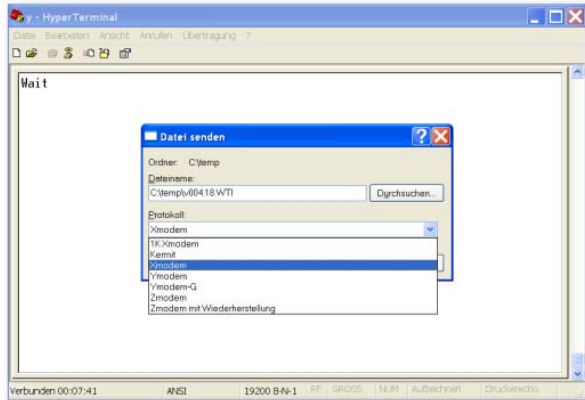
2.) Next you should see the following:



3.) Now chose the *.WTI file (for example C:\temp\v004.18.WTI)



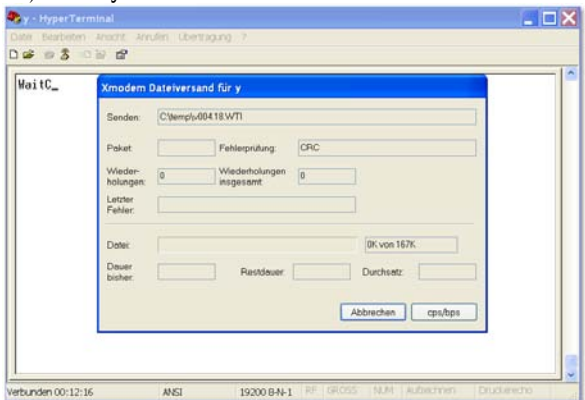
4.) As protocol you must chose XModem (do not select "1K XModem")



5.) Then press send



6.) And you should see the transmission screen



Now choose "Load Firmware" and then "Erase FLASH" on the DTC-720

After a few seconds the DTC-720 will attempt to start the transfer with XModem in CRC-mode. If there is no response after 35 attempts, the DTC-720 will automatically switch to Checksum mode to proceed. If there is no answer here it will time out. If the download finishes correctly you will be able to read the firmware version on the first line of text. If you had a problem with the download you will only see the ASCII character "-". In encoded *.WTI files the firmware version will always be the first 8 characters of the file name.

Send Firmware to PC

Using this function you can send the firmware stored in the HHC-SW to a PC or to some other device by using XModem transfer. The DTC-720 is waiting for a signal from the receiver to start the transfer. The transfer would proceed through the Device Port with the device Baud Rate.

Update Device

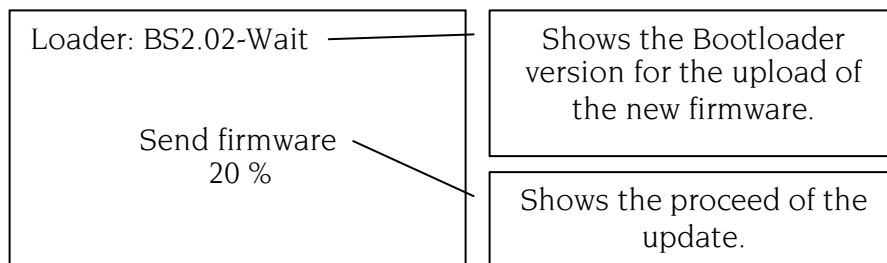
Here the DTC-720 is used to send firmware that was previously uploaded to the HHC-SW to a device. Before the upload, the desired baud rate and interface need to be set. The Baud Rate for the update is always 19.2K Baud. This rate is chosen automatically when the update starts. You must have the normal operational baud rate set to match the device to be updated, in order to send the "remote reset" command to the device. This would normally be 2400 Baud for Pelco D code and 4800 Baud for Pelco P code. The normal RS485 control interface is used for the data transfer.

Example of updating a Sidewinder

When this menu item is selected, the Sidewinder is restarted via the software, and the boot loader in the Sidewinder waits for an entry. The upload to the Sidewinder then starts automatically. After the upload, the camera is restarted and can be operated using the new firmware. If there is an error in the upload, no further attempt can be undertaken with the desktop controller.

If there is an error, the following procedure should be adopted:

- Start by turning off the power supply to the Sidewinder.
- Select menu item "Update" on the desktop controller.
- Turn on the power to the Sidewinder again.
- The boot loader and the upload will now once again be triggered automatically.



Example message from Bootloader.

Updating the DTC-720

This function enables software updates for the desktop controller to be loaded. The updates are always imported from a PC via the RS-485 interface. The Baud Rate is always 19.2K Baud. When this menu item is selected, the boot loader is activated (restart of the desktop controller).

To initiate the upload process, reconfirm the update selection by selecting “Reboot” and pressing the Enter key. A reset will now take place. The new firmware should be sent to the DTC-720 using a terminal program such as HyperTerminal using the same procedure described in the “Update Device” section. During the update you should see “Wait until the update is finished” on the display.

The download of the software cannot be interrupted. If any interruption does take place, the power supply of the desktop controller will need to be switched off and on again. Continuation of the update process already begun is not possible.

The boot loader can be restarted only by switching the power off and on again. While the boot loader is scanning for the trigger key you must send the trigger key and start the upload of the new firmware.

NOTE: If you start the upload of new firmware for the DTC-720 you can not interrupt the process. The PIC stores the new firmware in the internal FLASH and erases the old firmware as it goes. If you interrupt the upload you must recycle the power to the DTC-720 to start it again and resend the new firmware from the beginning. In this scenario you won't see anything on the DTC-720 display, because only the bootloader section of the firmware will be running, not the normal operational firmware that controls the switches and displays.

Update AI

*This function will be used for updating a future Alarm Interface accessory product for the Sidewinder.

Show Device Bootloader Version

With this function you can read out the Bootloader version of a device without starting the update of the device. You also can use terminal software to read out the boot loader version.

NOTE: After sending the trigger key to a device you get the version of the bootloader. Now you must wait, until the device stop scanning for the trigger key or you must switch the device off and on again.

Special Functions

The Sidewinder uses a few special presets to implement functions that are not supported in the Pelco codes. These special commands can also be executed using the DTC-720.

The following commands are supported:

- **EIS ON / EIS OFF** for switching the Electronic Image Stabilization on or off.
- **Set EIS to 5Hz / 16Hz** for setting the Frequency Range select of the EIS

System

The settings made are stored in the internal EEPROM and reloaded when the device is restarted. The following options may be set.

Device Port Settings

The desktop controller uses one RS485 interface for all of the different communication functions. Here you can set the baud rate for the interface.

Device Control Baud Rate

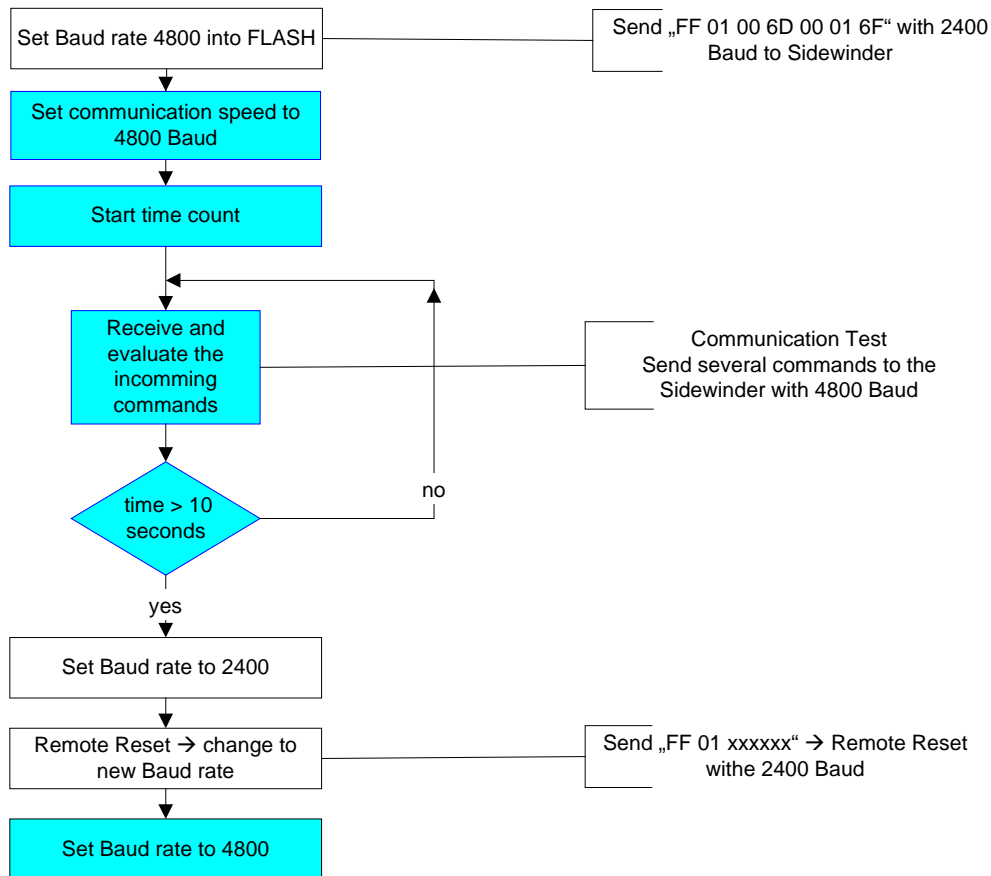
Here you can change the Baud Rate for the DTC-720 by itself or also for the device. If you select "Change Baud Rate", you only change the baud rate for the primary interface of the DTC-720.

If you select "Set Sidewinder Baud Rate", it changes the Baud Rate of the DTC-720 and also of the Sidewinder. If you change the baud rate of the Sidewinder you can test the new Baud Rate for 10 seconds*. If you have problems controlling the Sidewinder with the new Baud Rate it's easy to set the Baud Rate back without problems.

BAUD RATE

Example: change the Baud rate from 2400 Baud to 4800 Baud

On the right hand side you can see how the Sidewinder changes the Baud rate with test of the Baud rate. On the left side you see the commands that you send to the Sidewinder.



Blue – communication with 4800 Baud
White – communication with 2400 Baud

If you don't want to test the communication with the new Baud rate you can send a Remote Reset 0x0F during the test.

NOTE: If you don't want to test the communication you must send the Remote Reset with the higher Baud rate. After the Reset of the Sidewinder you will always have the new chosen Baud rate. Also, during the 10 seconds of testing the Baud Rate, the Sidewinder won't store any incoming commands.

Device Termination

Switching on or off of the termination for the RS-485 interface. These settings are stored in the internal EEPROM and reloaded when the device is restarted. You can find this menu at "Port Settings".

Response (on/off)

This menu item selects whether the DTC-720 waits for a response from the device. If you have no feedback from the device you should not enable this feature. If you enable this feature you must wait for the timeout. Your setting would be stored in the EEPROM.

Show Alarm (on/off)*

If you switch this feature to on the DTC-720 will display the received alarm codes. Whenever you move the joystick (pan, tilt or zoom) or the lens control keys (focus or iris) the DTC-720 will show the received alarm data.

You can read the incoming code as text in the display. To acknowledge the alarm you can press ENTER. Then the DTC-720 sends the command "Alarm Acknowledge" 0x19 to the camera. If you press another key you can control the camera but the alarm acknowledge would not be transmitted.

**This function is only available when you connect the Rx+ / Rx- coming from the camera.*

Alarm Interface Functions

The default for AI functions is OFF. When you choose this menu item the AI functions will be set to ON. After switching the AI ON you can control the AI firmware version and look for the AI Status. You must set the AI functions to ON that the DTC-720 send the correct commands while a Baud Rate change or Update of a Sidewinder with AI in front.

AI Status

Here you can look for the status of the AI.

For example: After pressing the ENTER key you received first page of the AI status.

DIP switch settings			
Inv.1	-	Inv.2	x
Inv.3	x	Inv.4	x
T-Out	-	T-In	-
Priority	x		
AI Inputs			
ALARM1	x	ALARM2	-
ALARM5	-	ALARM4	-

- : DIP switch set to OFF
x : DIP switch set to ON

- : contact at the AI-Input open
x : contact at the AI-Input closed

At this example the switch contact at Alarm Input 1 is “open” and all contacts are closed.

Now you must press the ENTER key again.

AI Code version:	Pelco D-Code
AI Baud Rate:	4.800

After this page you also must press the ENTER key.

AI Functions Off: Here you can switch the AI functions off.

Code (P-Code/D-Code): Here you can change from Pelco D-Code to Pelco P-Code.

If you change from Pelco D-Code to Pelco P-Code or back the Baud Rate will default to the following values:

Pelco D-Code with 2.400 Baud
Pelco P-Code with 4.800 Baud

NOTE: To use other combination, choose the Baud Rate after changing the code version.

About: Shows the version of the firmware for the handheld controller.

The version of the Bootloader is not shown here. You can find the version by using terminal software and a PC. Go ahead like you want to update the DTC-720 and send the trigger key after switching on the DTC-720. Then the Bootloader start with sending the version and the string "-Wait".

SPECIAL INTERNAL MENUS

Special Internal Menus

You can only get to these special menus by entering a password code.

If the device number is visible in the display, press the FUNC/ON key. Now you can input the code for the internal menu. There are two internal menus available.

Menu one uses code "24685" with the following sub menus:

- Command List
- Status
- Repetition Time
- Show Position
- Double Click
- Show Input

The second menu uses code "15964". Here you can adjust the Joystick and set the Pass Level and change the password.

- Show Value
- Adjust Joystick
- Save and End
- Set Pass Level
- Don't Save and End
- Set Pass

The second menu is protected by a password. Always when you enter this menu you must input the password. The factory password is "5522".

Do not press any other key while you input the code. Your input will not be shown in the display. If you input one of the codes correctly you will find the following menus.

NOTE: Press the FUNC/ON key to exit the special menus.

Command List *(For more details refer to "Software Protocol Manual for Sidewinder P-D")*

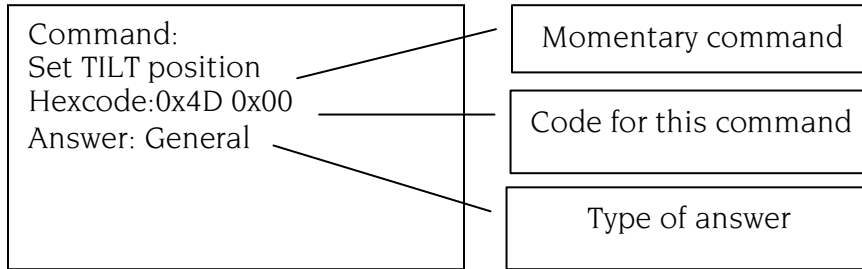
A camera command may be selected from the list of available commands based on the protocol that is being used. Commands are displayed in plain text and hex code (Sidewinder P-D code). Commands are selected with the assistance of the keys 'up' and 'down', enabling upwards and downwards scrolling of the list. When the desired command is displayed, this may be selected via the "ENTER" key. Depending on the command selected, further entries may need to be made.

When commands have been entered, they are sent via the interface to the camera (device) number. The interface and the camera number need to be set prior to the selection of the command. Once the command has been sent, a waiting loop system awaits a response. As soon as the number of characters required for the response has been received or when the time-out point is reached, the waiting loop is interrupted. Either the response is received or a time-out error message is now displayed. The display continues until either the ENTER or FUNC key is pressed. ENTER evaluates the response received and converts it into plain text. FUNC provides a list for the re-selection and sending of a command. You may exit the list by pressing FUNC.

SPECIAL INTERNAL MENUS

For example:

You see the command "Set TILT position". To perform the command press "Enter." To choose



the next / previous command use keys 'up' or 'down.'

Status: This sends a continuous call for the status of the Sidewinder. So you see the internal temperatures and alarm code. The repetition time can be changed in the system menu with repetition time.

Repetition time: This sets the time interval at which commands are sent to the Sidewinder. Continuous position queries as to position are sent to the camera at the selected interval. This interval is also used for PAN and TILT positions in the positioning process via show position in this menu. This value is stated in milliseconds and can be between 400 and 9999 (500 milliseconds to 10 seconds). The default value is 500 milliseconds. This value is saved in the EEPROM and reloaded when the device is restarted.

Show Position (on/off): If you switch this function to on, you see in the main menu the position of the PAN and TILT. The controller shows the angle of the position. This value is saved in the EEPROM and reloaded when the device is restarted.

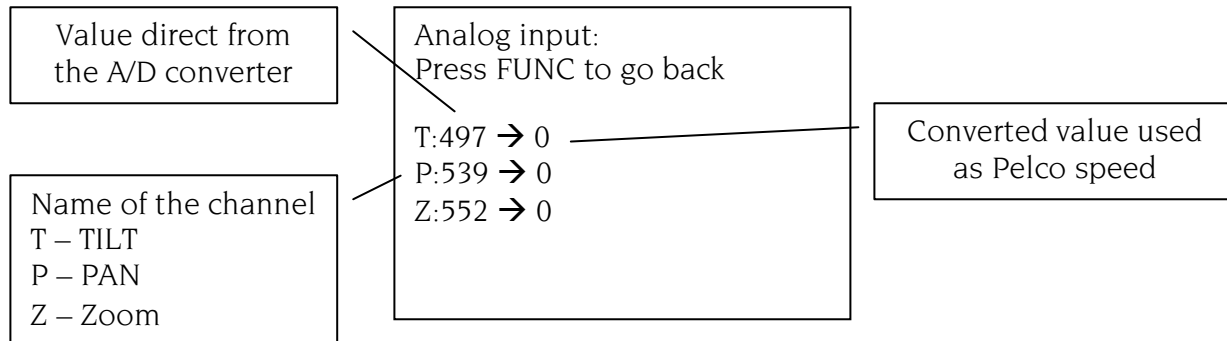
Double Click (on/off): Here you can select whether to use the Turbo-Mode with double clicks of the arrow-keys. With double click enabled, all of the arrow-keys will send 0x40 to the camera if you press the key twice quickly and hold it down. If you press the key only once and hold it down you send the chosen speed. This value is saved in the EEPROM and reloaded when the device is restarted.

Show Input: choosing this menu item allows you to display all of the RS-485 data being received on the RX data port of the DTC-720. There is no control of checksum or anything else. The DTC-720 just shows the data. After reaching the last line of the display the first line will be overwritten and so on. You must set the right Baud rate and primary interface before you start this menu. To leave this selection press FUNC. This function can be useful for troubleshooting data connections.

Show Value: Here you can see the analog input (direct from the A/D converter) versus the value that is used as Pelco speed.

SPECIAL INTERNAL MENUS

For example:



Adjust The Joystick: Under this sub menu you can adjust the joystick. You must follow the instructions on the display.

For example:

If you enter the menu you should see:

```
Center Joystick
    → Enter

T:475 → 0
P:539 → 0
Z:552 → 0
```

Do not move the joystick from center. Wait for a few seconds then press Enter. Don't change the Zoom position on the joystick. For adjusting the Zoom, the internal processor only has to calculate variables at the first step. This is because the Zoom speed can't be changed with the joystick. So we only need the "center" position for the Zoom.

Now the internal processor calculates the internal joystick offset variables. When this is done you will see the following screen until you release the Enter key.

```
Center Joystick
    → Done

T:475 → 0
P:539 → 0
Z:552 → 0
```

SPECIAL INTERNAL MENUS

After you release the Enter key and move the joystick to the upper right corner you will see

```
Upper right corner
  → Enter

T:907 → 60
P:967 → -62
Z:552 → 0
```

Hold the Joystick at this position and then press the Enter key. Now the internal processor calculates the internal variables. When this is done you see the following screen until you release the Enter key.

```
Upper right corner
  → Done

T:907 → 64
P:967 → -64
Z:552 → 0
```

After you release the Enter key and move the joystick to the bottom left corner you see

```
Bottom left corner
  → Enter

T:20 → -64
P:96 → 64
Z:552 → 0
```

SPECIAL INTERNAL MENUS

Hold the Joystick at this position and then press the Enter key. Now the internal processor will calculate the internal variables. When this is done you see the following screen until you release the Enter key.

```
Bottom left corner
  → Enter

T:20 → -64
P:96 → 64
Z:552 → 0
```

After you press enter, the DTC-720 automatically changes back to the previous sub menu and the internal variables are calculated.

Under the sub menu "Show analog" you can control the result of the adjustment.

```
Analog in / pass
Show value
Adjust joystick
Save and end
Set pass level
Don't save and end
Set pass
```

Choose "Save and end" to save the adjustment to the FLASH.
With "Don't save and end" you discard the new calculation and leave the sub menu.

Save and End: This menu item saves the result of a new adjustment.

SPECIAL INTERNAL MENUS

Set Pass Level: Under this menu item you set the pass level. This means you select a status when the user must input the password. You can set the pass level to the following value.

Pass level	Meaning
1	You must enter the password for entering the "15964" menu. For the "15964" menu you must always input the password. This is the default value for pass level.
2	You must enter the password for entering the "15964" and the "24685" menu.
3	You must enter the password after pressing the FUNC key.
4	You must always enter the password for every function of the DTC-720. If you press any button or when you move the Joystick the DTC-720 ask first for the password. This point is an option and not implemented at the moment.

An entered password is valid for 2 minutes. For the valid time you don't need to enter the password again. You can use the function again without the input of the password. The valid time only expires if you don't press any key or you don't move the Joystick of the DTC-720. After the valid time has expired you must enter the password again.

Do Not Save and End: Selecting this menu item leaves the menu without saving the new adjustment.

Set Pass: This menu item allows you to change the password. To change the password, follow this example. For this example the old password is "5522." First you must enter the old password (here "5522").

```
Please enter your  
Password  
FUNC → break  
****
```

The input is not displayed. Only the * sign appear for each number that you press. To abort this input you must press the FUNC key. If you entered the right password the DTC-720 will go to the next step.

```
Please enter new  
Password  
FUNC → break  
****
```

SPECIAL INTERNAL MENUS

Now the DTC-720 asks for a new password. You must input four numbers and then press Enter. The screen will change to

Confirm new
Password
FUNC → break

Now you must input the new password again to confirm your input. If you enter the password a second time correctly, the password will be stored to the internal FLASH, and the DTC-720 display will change to

Analog In. / Pass.
Show value
Adjust Joystick
Save and end
Set pass level
Don't save and end
Set Pass

Press "FUNC" to jump back to the previous menu.

TROUBLESHOOTING

Problem	Possible Reason	Possible Solution
No display on the LCD screen when power is on.	Power supply is not connected properly.	(1) Check connection of power line. (2) Make sure power supply is 12V DC.
No way to control designated camera.	(1) Protocol is not correct. (2) Baud rate is not correct. (3) Address is not correct.	(1) Check to see if the keyboard protocols match that of the camera. (2) Check and make sure that the baud rate of the keyboard and the camera match. (3) The number in the CAM or DATA area does not match the address of the camera you are trying to control.
No beep sound when pressing a key.	Key-press sound has been disabled.	Start up the key-press sound in the keyboard settings.
The keyboard isn't responding quickly to commands.	The joystick has not been properly configured.	Reset the joystick values as outlined in this manual.
Other problems.	~	Contact WTI.

For more information, please contact one of WTI's knowledgeable "solutions specialists" toll free at 1/866/gotowti.

TECHNICAL SPECIFICATIONS

Interface	8 Pin RJ45 (Compatible with Pelco KBD300A)
<i>Camera Communications</i>	
Physical Layer	Full Duplex RS-485 (TX+, TX-, RX+, RX-)
Baud Rates	2400 / 4800 / 9600 / 19200
Code Support	Pelco D and Pelco P
<i>PC Communications</i>	
Physical Layer	Full Duplex RS-485 (TX+, TX-, RX+, RX-)
Baud Rate	19200
Format	8 Bits Data – No Parity – 1 Stop Bit
Protocol	XModem – 128 Byte Block – CRC – Check Sum
Display	128 x 64 OLED
Joystick	Proportional 3 Axis with spring return
Keypad	Electro-mechanical with tactile feedback
Power	12VAC or 12VDC at 100mA
Dimensions	9.5"W x 7.25"D x 2.25"H (4.0"H w/Joystick) / 24.13 cm W x 18.42 cm D x 5.72 cm H (10 cm H w/joystick)
Weight	1.9lbs (862g)
<i>Environmental</i>	
IP Rating	IP 30
Operating Temperature	0°F to +120°F (-17°C to +49°C)
Operating Humidity	10% to 90% non-condensing
Supplied Accessories	Cable Breakout Box, 10' Cable, Power Supply





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Due to Wireless Technology, Inc. (WTI) continuing efforts to engineer the best product that is most responsive to our customer's needs, the above specifications are subject to change without notice.