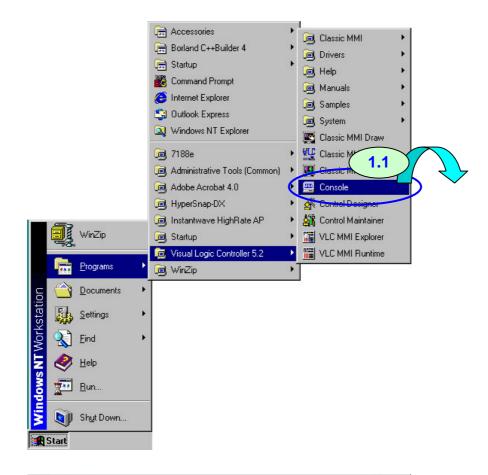
# SteepleChase VLC Linking to Modbus/TCP

## **Relative drivers installation**

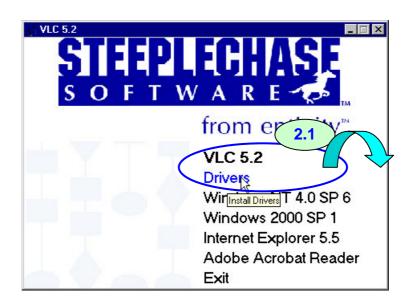
Step 1. Configure Ethernet adapter cards.



Runtime Console			_ 🗆 ×
Execute	RT Info	RT Men	nory
Real-Time TCP/IP Drivers Real-Time TCP/	/IP Configuration	MMI Config	About
Real-Time TCP/IP			
Reduced Priority			
Ethernet Interface Card			
C ISA <u>NE 2000</u> I/O <u>B</u> ase IRQ 0x0300 V 10 V			
C PCI DEC (Tulip)			
PCI Intel (82557/8/9)			
Other Params ntrans=256 ncbs=25			
OK	Cancel	Apply	Help

Runtime Console			_ 🗆
Execute	Startup RT In		лy
Real-Time TCP/IP Drivers	Real-Time TCP/IP Configu	uration D MMI Config	About
Interface Name			
TCP/IP			
IP Address	Subnet <u>M</u> ask		
192 . 168 . 30 . 68	255 . 255 . 0 . 0	]	
Default <u>G</u> ateway			
192 . 168 . 255 . 254			
Enable DNS			
Domain icpdas.com			
Server # <u>1</u>	Server # <u>2</u>	Server # <u>3</u>	
192.168.0.1			
	1.4		
	OK Cancel		Help

Step 2. Install Modbus/TCP driver from SteepleChase CD.

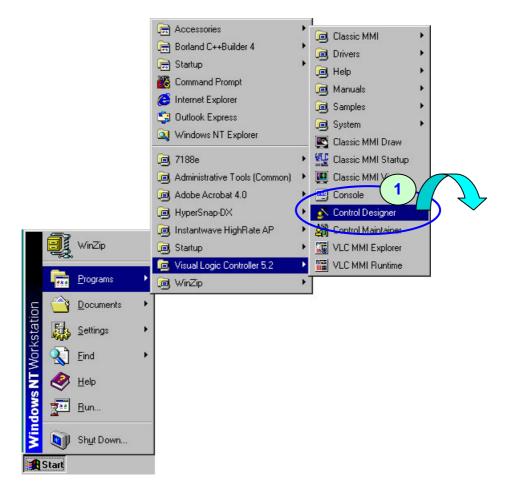


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Date		
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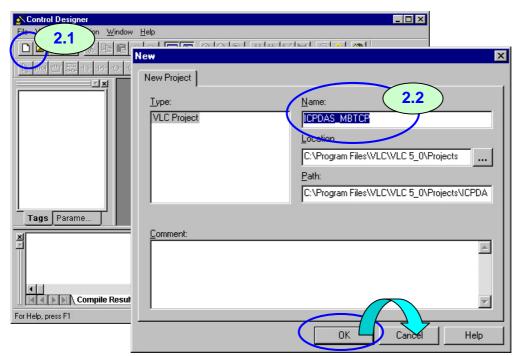
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← → → ③ ② ☆ ☆ ◎ ∞ ∞ ③ ■ ▲ → A → A → A → A → A → A → A → A → A →	<b>Print</b>		
dress 🛃 H:\Drivers\Drivers.Html			r (∂Go Link
option	0.21	2/20/01	
MEI	6.53	5/4/01	Install 2
Modbus/TCP I/O ** Requires installation of TCP/IP using custom VLC installation option	6.3	3/23/0	Install
Madiata Damata VO (000 Cariata)		44/00/07	Install

## Launch Modbus/TCP Devices

Step 1. Run SteepleChase Control Designer.

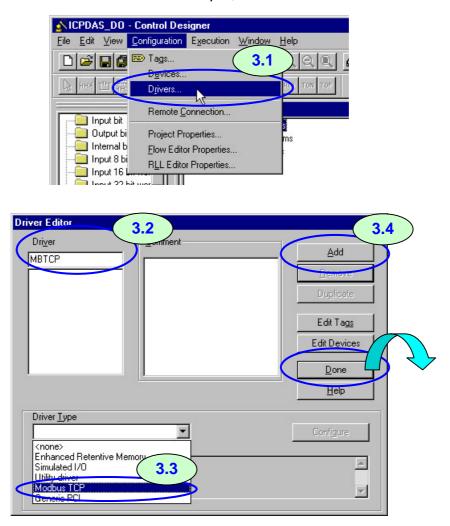


Step 2. Create a new project file. For example, named as ICPDAS\_MBTCP.

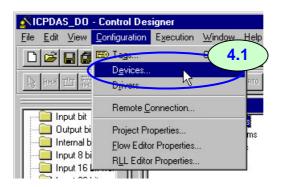


SteepleChase VLC Linking to ICPDAS I-8000 Modbus/TCP controller [Ver 1.0.0 Aug,2002] -- 4

Step 3. Add a Modbus/TCP driver. For example, named as **MBTCP**.



Step 4. Add all DOs as a Modbus/TCP station device. For example, named as **DO\_Station**.



De	vice Editor 4.2		4.5
$\langle$	Device Comment	Add	
		<u>H</u> emove Duplicate	
	Driver 4.3	Edit Ta <u>gs</u> Edit Dri <u>v</u> ers	
	MBTCP	Done	$V \rightarrow$
	Show <u>o</u> nly devices on selected driver	<u>H</u> eip	
	Device <u>Type</u>	Configure Browse	
_	<none> 4.4 Discrete Finput Station Discrete Output station</none>	Diowse	
	Discrete Input & Output Station Analog or Class 0 Input station Analog or Class 0 Output Station	Ī	<u>-</u>
	Analog or Class 0 Input & Output Station Discrete Input Device Discrete Output Device		
	Discrete Input & Output Device Analog or Class 0 Input Device Analog or Class 0 Output Device		
	Analog or Class 0 Input & Output Device	5	

Step 5. Configure the Modbus/TCP station device.

Device Editor	×
Device Comment-	Rename
DO_Station	
	Edit Tags
Drįver	E dit Drivers
MBTCP	
Show <u>o</u> nly devices on selected driver	
Device <u>Type</u>	Configure
Station, Discrete Output (0xxxx) Device Description	Browse 5.2
This is an discrete station with output (0xxx	
NetID (Station number)	Modbus Station Station IP Address
	1 192 168 41 8 ✓ Critical
DO base address	Reference No.
	Bute (8 bit) 30ms (d)
Total DO points	Length (in units)     ○ Word (16 bit)     Reconnect Interval       1     ○ Double (32 bit)     10 seconds (d)
	<u> </u>

**Modbus Station:** also called NetID, for I-8000 controllers, you can find a dipswitch (at right side of controllers) to set the station number. After changing the station number, you must reboot the I-8000 controller.

Modbus Utility Ver 1.0.0 File Help Load Save Help Exit	it .
192.168.41.8 Online Mode (Ethernet)	Connect
I-8053	Disconnect

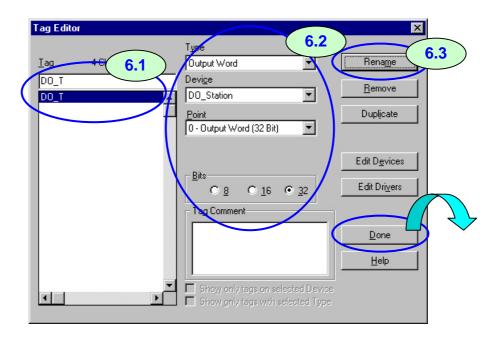
**Reference No:** you could plug several DO modules in one I-8000 controller. These addresses of points are continually. For getting best performance, you better group all DO modules, and only add one DO Modbus station or Modbus device to one VLC project. That VLC Modbus/TCP driver can set all DOs with one execution action.

-

**I/O Unit & Length:** Choose the most convenient I/O unit, and calculate how many units do total DOs need.

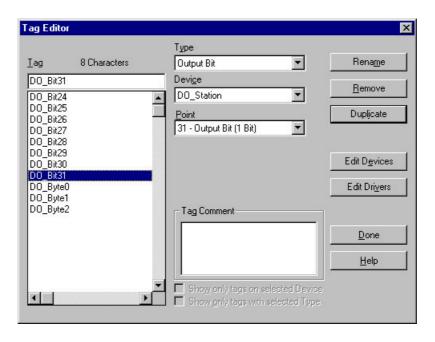
The most convenient way is reference the Summary in Modbus Utility (of ICPDAS). The first address is always 0.

	ngitai m	odule Mapping		Analog Mod		ipping ]		Summary	
Slot	Module	DI (1xxxx) address	Point	DO (0xxxx) address	Points	Al (3xxxx) address	Points	AO (4xxxx) address	Points
0	1-8053	00 [00]	6					±1.	
1	I-8017H	Cherrister St.	-			00 [00]	8		
2	1-8024	-	7					00 [00]	4
3	1-8041	-		00 [00]	32				2

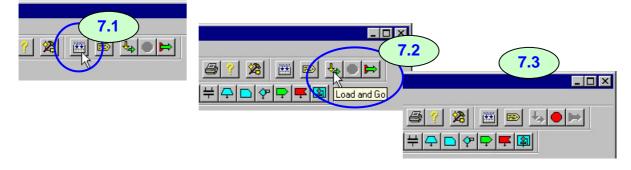


Step 6. Add tags of DOs. For example, named as **DO\_T**.

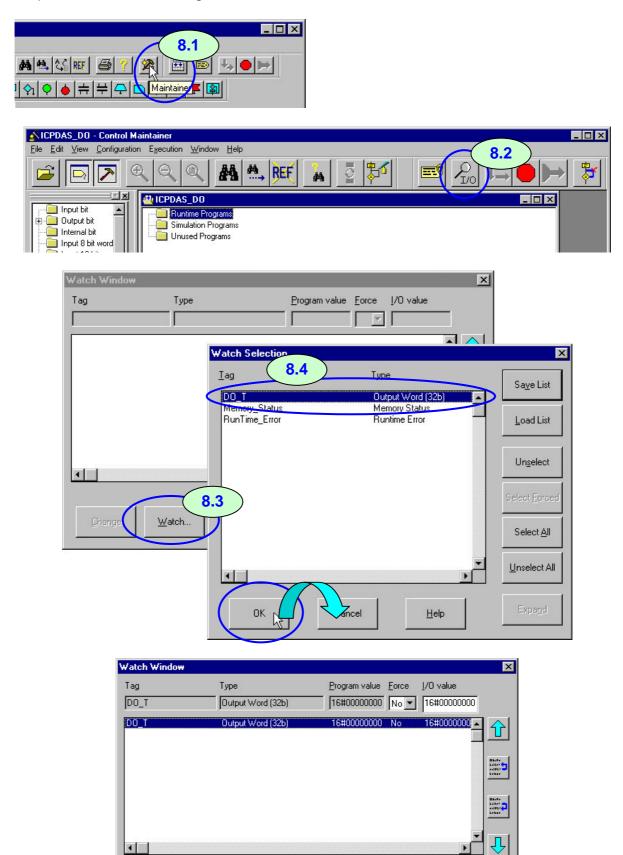
You can also mix several tag types. For example, byte tags and bit tags.



Step 7. Compile, download and run the project.



Step 8. View the DO\_T tag.



✓ Hexadecimal

Change

Watch.

String

Toggle Force

•

Done

Help

Step 9. Test the DO\_T tag.

By using Controller Maintainer, you can input different values to easily test the DOs without program code.

Watch Window		9.2	9.1
Tag	Туре	Program value Force	value
DO_T	Output Word (32b)	16#F0F00F0F	#11115555
DO_T	Output Word (32b)	16#F0F00F0F Yes 12	
			Baity Latter villet Latter
			Date Liter city
•			<u> </u>
	. ✓ He <u>x</u> adecima		
<u>C</u> hange	<u>W</u> atch Toggle ⊻alue	Toggle Force Done	<u>H</u> elp

Step 10. Add all DIs as a Modbus/TCP device. For example, named as **DI\_Device**.

	Device Editor			×	
10.1		Modicon TCP D	evice		
	DI_Device DI_Device DO_Station	Modbus Station	Station ID (IP Address)	<u>Q</u> K <u>C</u> ancel	
	Drįver MBTCP	Length (in units)	Device IO Units C Byte (8 bit) C Word (16 bit) C Double (32 bit)	<u>H</u> elp	
	Show only devices on sel				
	Device <u>Type</u> Discrete Input Device Device Description			Configure 10 Browse	.3
	This is a binary device with	n input bits connect	ed to a station.	A Y	

**Note:** You can mix different device type modules in one I-8000 controller. When you add the I-8000 controller to VLC, the first device type should be **Station**, and others should be **Devices**. That's why in step 5, the Device type I chose is Station, and here, I set it as Device.

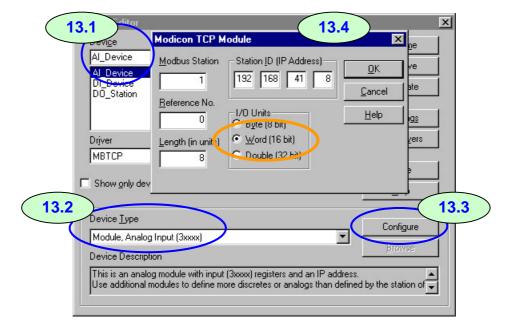
X Tag Editor 11.2 11.3 11.1 Type -Add 4 Characters <u>1</u>ag Input Word Г Devi<u>c</u>e DIT DI\_Device -DO\_T Point -0 - Input Word (16 Bit) Edit D<u>e</u>vices Bits Edit Drivers ● <u>1</u>6 O <u>8</u> Tag Comment Done Help Show only tags on selected Device • .

Step 11. Add tags of DIs. For example, named as DI\_T.

Repeat Step 7 and Step 8 to view the DI\_T tag.

Step 12. TestTurn on hardware DI channels and view if the VLC sense the change. For example, turn on the first channel.

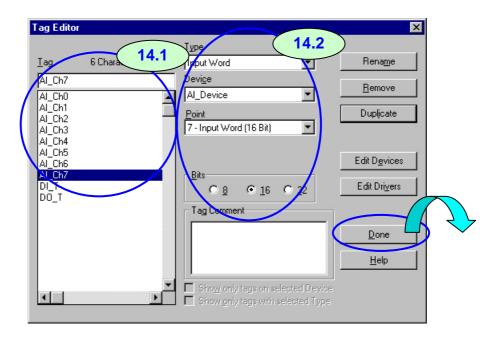
Watch Window	¥3				×
Tag	Туре	<u>P</u> rogram value	<u>F</u> orce	<u>1</u> /0 value	
DI_T	Input Word (16b)	16#0001	No 💌	16#0001	Ţ
DI_T	Input Word (16b)	16#0001	No	16#0001	<u>-</u>
					Latter Latter Letter
					Dkife Lillet ciFL Lekse
<b>ا</b>				Þ	2
	🔽 He <u>x</u> adecimal	String 💌			
<u>C</u> hange	<u>W</u> atch Toggle <u>V</u> alue	Toggle Forc <u>e</u>	Dor	ne	<u>H</u> elp



Step 13. Add all AIs as a Modbus/TCP device. For example, named as AI\_Device.

**Note:** every analog (AI and AO) register occupy 2 bytes, the I/O Unit must set to Word (16 Bits).

Step 14. Add tags of Als. For example, named as AI\_Ch0 ~ AI\_Ch7.



Repeat Step 7 and Step 8 to view the Al\_Ch0 tag.

Step 15. Test AI\_Ch0.

Input analog input to hardware AI channels and view if the VLC sense the change. For example, intput 2.0 V to AI\_Ch0.

Watch Window	P			×
Tag Al_Ch0	Type Input Word (16b)	Program value	Eorce 1/0 No 🔻 16#	Heluc Forces 199A Exist!
Al_Ch0	Input Word (16b)	16#199A	No 16#	
•				
<u>C</u> hange	✓ Hexadecimal       Watch   Toggle ⊻alue	String 💌 Toggle Forc <u>e</u>	Done	

The value is 16#199A (6554). To get the actual voltage, you need to converter it.

### **Converter formula is:**

analog input value = VLC value / 32767 \* Span

Span = analog input maximum value - 0

In this case, the Span is 10.0.

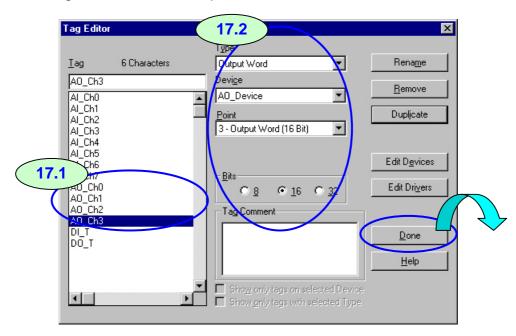
Analog input value = 6554 / 32767 \* 10.0 = 2.000 (V)

Digital Module Mapping				Analog M	Analog Module Mapping			Ľ	Summary		
Analog Input (3xxxx)						Analog Output (4xxxx)					
Address	Module	Slot	Channel	Comment		Address	Module	Slot	Channel	Comment	
00 [00]	I-8017H	1	0	[08] +/- 10.0 V		00 [00]	1-8024	2	0	[33] -10.0 To +10.0 V	
01 [01]	1.9017H	1	1	[08] +/ 10.0 V		01 [01]	1-8024	2	1	[33] -10.0 To +10.0 V	
02 [02]	I-8017H	1	2	[08] +/- 10.0 V		02 [02]	1-8024	2	2	[30] +0.0 To +20.0 mA	
03 [03]	I-8017H	1	3	[08] +/- 10.0 V		03 [03]	1-8024	2	3	[30] +0.0 To +20.0 mA	
04 [04]	I-8017H	1	4	[06] +/- 20.0 mA		1.1.1.1.1.1.1.1.1					
05 [05]	I-8017H	1	5	[06] +/- 20.0 mA							
06 [06]	I-8017H	1	6	[06] +/- 20.0 mA							
07 [07]	I-8017H	1	7	[06] +/- 20.0 mA							
4					F I	1					

X 16.1 16.4 Modicon TCP Module х AO\_Device Al\_Device Modbus Station Station ID (IP Address) AO\_Device <u>0</u>K DI\_Device DO\_Station 192 168 41 8 1 <u>C</u>ancel Reference No. 1/0 Units Help 0 Byte (8 bit) Driver ● <u>W</u>ord (16 bit) MBTCP Length (in units Double (32 5%) 4 E Show only devices a evice "AO\_Devi 16.2 vice <u>T</u>ype Configure Module, Analog Output (4xxxx) . **Device Description** This is an analog module with output (4xxxx) registers and an IP address Use additional modules to define more discretes or analogs than defined by the station of

Step 16. Add all AOs as a Modbus/TCP device. For example, named as **AO\_Device**.

Step 17. Add tags of AOs. For example, named as AO\_Ch0 ~ AO\_Ch3.



Repeat Step 7 and Step 8 to view the AO\_Ch0 tag.

Step 18. Test AO\_Ch0.

Force hardware AO channels and view if the VLC sense the change. For example, output 5.0 V to first channel. In VLC, you need input VLC value

### **Converter formula is:**

VLC value = analog output value / Span \* 32767

Span = analog out maximum value - 0

VLC value = 5.0 / 10.0 \* 32767

= 16383 (16#3FFF)

/atch Window			18.	2		18.1
Tag	Туре		Program Value	Eorce	1/0 value	
AO_ChO	Output	Word (16b)	16#0000	Ye: 🔻	16#3FFF	Exist!
AO_ChO	Output	Word (16b)	16#0000	Yes	16#3FFF	
						Date:
						Lekse
						Dhife Life's viffLt Leker
•		₩ Hexadecima	String	18.3		Lillet editor

Digital Module Mapping 🍸 🗚				🔄 🕺 Analog Mo	Analog Module Mapping			Summary		
Analog Input (3xxxx)					Analog Output (4xxxx)					
Address	Module	Slot	Channel	Comment	Address	Module	Slot	Channel	Comment	
00 [00]	I-8017H	1	0	[08] +/- 10.0 V	100 [00]	1-8024	2	0	[33] -10.0 To +10.0 V	
01 [01]	I-8017H	1	1	[08] +/- 10.0 V	01 [01]	10024	2	1	[22] 10.0 To +10.0 V	
02 [02]	I-8017H	1	2	[08] +/- 10.0 V	02 [02]	1-8024	2	2	[30] +0.0 To +20.0 mA	
03 [03]	I-8017H	1	3	[08] +/- 10.0 V	03 [03]	1-8024	2	3	[30] +0.0 To +20.0 mA	
04 [04]	I-8017H	1	4	[06] +/- 20.0 mA	20000000					
05 [05]	I-8017H	1	5	[06] +/- 20.0 mA						
06 [06]	I-8017H	1	6	[06] +/- 20.0 mA						
07 [07]	I-8017H	1	7	[06] +/- 20.0 mA						
4				•					•	