

ol :(: .:	□ tDS/tGW/tSH	D PETL/tET/tP	ET/ET-2200	DS/PDS/PPD	□ tM-752N		
Classification	□ I/O Card	UVXC Card		☑ TouchPAD/HMIWorks		□ VxComm	
Author	Tammy	Date	2018-11-19		No.	FAQ031	

Q: How to use analog I/O function of XV-board with VPD products?

A: HMIWorks has built-in support for XV-board with easy integration. The **"Engineering Unit"** data format is forced for AI/AO by default. Therefore, value 0 - 10,000 is mapped to 0 - 10V and value 0 - 20,000 is mapped to 0 - 20 mA for example. Refer the following procedure to create a sample program of channel 0 current output range 0 to 20 mA. Here, we will use the VPD-133-H with XV307 as an example.

Step 1: Launch the HMIWorks Standard software. And based on your TouchPAD device (e.g., VPD-133-H), create a new project. Here, we will use the **"[2] Ladder"** mode as an example.

New	>	<
C TPD		
VPD-130 VPD-130-H VPD-132	lout	
VPD-132-H VPD-133	Location (Don't use space or special char):	
VPD-133-H	C:\ICPDAS\HMIWorks_Standard\Projects	
VPD-142 VPD-142-H VPD-143 VPD-143-H	Orientation	
VPD-173N VPD-173N-64 VPD-173X	C Portrait C Portrait Flip	
VPD-173X-64	C Landscape C Landscape Flip	
	Default Programming Type	
	C [1] Standard C C [2] Ladder	
	<u>Q</u> K <u>C</u> ancel	



Step 2: Press <F3> key or click the "Register Devices (I/O) F3" option from the "HMI" menu to open the "Devices" window to register the XV-board module (e.g., XV307).

Frame1 - [Vout - HMIWorks STD v2.10.38 (Nov.07, 2018)]								
bile Edit Layout Arrange View	v H	IMI	Project	Run	Window	Tools	Help	_)
Workspace Toolbox			Project New Fram Delete Fra Rename F New Virtu Register D Ladder De Bind Tags	e me rame al Tao Devices	Ctrl+M F2 (I/O) F3 F4		Heip	Jow www.
		`~~ ~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	3

Step 3: Step by step specify or fill each field and click the **"OK"** button to import tags.

bevic	ces								_		Х
Device	e information-			Γ	Tag Name	IO Type	Start Address	Default Value	Comment		^
Touc	hPAD is:	Modbus RTU Master	·	▶	DIO	DI	0	0			
			_		DI1	DI	1	0			
Devid	ce Series:	XVBoard	·		DI2	DI	2	0			
Conr	nection:	XVBus	-		DI3	DI	3	0			
Mod	ol Namo:	XV307	Select		ENABLE_DI	Virtual	0	1			
WIGG	er ivanie.	D	Anning		DI_Counter0	DI	0	0			
Devic	ce Name:	Dev_XV307_1	Assign		DI_Counter1	DI	1	0			
Net I	ID:	1	(1~247)		DI_Counter2	DI	2	0			
Time	eout:	200	ms		DI_Counter3	DI	3	0			
Scar	n Time ·	200	me		ClearCounter0	Virtual	0	0			
Ocar	i i i i i i i i i i i i i i i i i i i	200	113		c						>
				1		1			-		1
<u>OK</u> <u>Clear All Iags</u>											

brame1 - [Vout - HMIWorks STD v2.10.38 (Nov.07, 2018)]
🛃 File Edit Layout Arrange View HMI Project Run
Workspace Toolbox
File
⊕ 🖅 Program }
Example Connection
Tags
E Device
2 Dev XV307 1 DI1
B Day XV307_1_DI2
Dev_XV307_1_ENABLE_DI
Dev_XV307_1_DI_Counter0
سلج Dev_XV307_1_DI_Counter1
E Dev_XV307_1_DI_Counter2
المسليل Dev XV30Z 1 DI Counter3
the second states and a second

Step 4: The creation of the **"Dev_XV307_1"** device is now complete.



Step 5: Modify the **type code of the Analog Channel** (e.g., AOO) depending on your needs. For detailed information about the type code of Analog I/O range, refer to <u>Appendices: Analog I/O Type Code</u> <u>Supported Table</u>.

1. Double click on the "Dev_XV307_1_TYPECODE_AO0" tag to open the "Edit Tag" box.



 Modify the type code in the "Default" field and click the "OK" button. For example, refer to XV303/XV-307/XV310: Analog Output Range to set the Default to 0 (0~20 mA).

Edit Tag		×
Name	Dev_XV307_1_TYPECODE_AO0	
Default	0	
Binding		
Comment		
	<u>Q</u> K <u>C</u> ancel	
	Edit Tag Name Default Binding Comment	Edit Tag Name Dev_XV307_1_TYPECODE_AO0 Default 0 Binding Comment QK Cancel



Step 6: Create a component "Label" to display the current value being output.

- 1. Click the **"Label"** object in the **"Widget"** section of the **"Toolbox**" pane, and then click the desired position on the design frame to place the widget. Change the widget size as required.
- 2. Click the "..." button from the TagName field in the Inspector to open the "Select Tag" window.
- 3. Double click on the tag Name (e.g., Dev_XV307_1_AO0) you want to associate with the **Label** object.
- Set the number of digits of the fractional part in the "DecimalDigits" property.
 Since the "Engineering Unit" data format is used, so the AI/AO tag is 1000 times to the real value.
 Therefore, we set 3 in the DecimalDigits property for showing correct value x.xxx on the Label widget.





Step 7: Create a component **"Slider"** to set the current value of the output.

- 1. Click the **"Slider"** object in the **"Widget"** section of the **"Toolbox**" pane, and then click the desired position on the design frame to place the widget. Change the widget size as required.
- 2. Click the "..." button from the TagName field in the Inspector to open the "Select Tag" window.
- 3. Double click on the tag Name (e.g., Dev_XV307_1_AO0) you want to associate with the **Slider** object.
- Set the maximum and minimum current range in the "Max" and "Min" fields. For example, Max = 20000 and Min = 0 that matches the AI/AO type code in "Engineering Unit" data format.



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Step 8: Setup Device.

The setup device methods depends on the type of TouchPAD device and download methods, refer to the <u>Section 3.4 Downloading Methods for TouchPAD of the TouchPAD Hardware User Manual</u> for more detailed information.

In this example, we use the VPD-133-H device to connect the Host PC via USB wiring and turn the rotary switch to position 9 mode (USB update mode) then reboot TouchPAD device.

Click the "Set up Device (TouchPAD)" option from the "Run" menu to select the USB download interface.



Step 9: Compiling and Downloading to Run.

The downloading program method to the TouchPAD depends on the type of TouchPAD device, refer to the <u>Section 3.4 Downloading Methods for TouchPAD of the TouchPAD Hardware User Manual</u> for more detailed information.

Click the **"Run (Render, Compile, Download) F9"** option from the **"Run"** menu, or press **<F9>** key. Once the download is complete, set the rotary switch to position 0 (Run mode) and reboot TouchPAD device.



Appendices: Analog I/O Type Code Supported Table

User can inquire the following table to set analog input or output range, each multi-function expansion board has the different analog input or output range. For detailed information refer to <u>XV-board hardware</u> <u>user manual</u>. Note: The "Engineering Unit" data format is used for AI/AO.

			8	8-
Type Code	Range	Data Format	Minimum	Maximum
00	.0	Engineering	0	+20000
	+0 ~ +20 MA	Hexadecimal	0000h	FFFFh
01	. 4	Engineering	+4000	+20000
UI	+4 ~ +20 MA	Hexadecimal	0000h	FFFFh
02	+0 ~ +10 V	Engineering	0	+10000
02		Hexadecimal	0000h	FFFFh
02	-10 ~ +10 V	Engineering	-10000	+10000
03		Hexadecimal	8000h	7FFFh
04	+0 ~ +5 V	Engineering	0	+5000
04		Hexadecimal	0000h	FFFFh
05	5~+5V	Engineering	-5000	+5000
00	-0 ~ +0 V	Hexadecimal	8000h	7FFFh

XV303/XV-307/XV310: Analog Output Range

XV306/XV308/XV310: Analog Input Range

Type Code	Range	Data Format	Minimum	Maximum	Open Wire (Broken Wire)
05		Engineering	-25000	+25000	-
	-2.3 ~ +2.3 V	Hexadecimal	8000h	7FFFh	-
00	00 00	Engineering	-20000	+20000	-
UO	-20 ~ +20 MA	Hexadecimal	8000h	7FFFh	-
00	10 - 10 \/	Engineering	-10000	+10000	-
Uo	-10~+10 V	Hexadecimal	8000h	7FFFh	-
00	-5 ~ +5 V	Engineering	-5000	+5000	-
09		Hexadecimal	8000h	7FFFh	-
0.4	-1 ~ +1 V	Engineering	-1000	+1000	-
UA		Hexadecimal	8000h	7FFFh	-
	-20 ~ +20 mA	Engineering	-20000	+20000	-
VD		Hexadecimal	8000h	7FFFh	-
1A	.0	Engineering	0	+20000	-
	+0 ~ +20 MA	Hexadecimal	0	FFFFh	-
10	XV306/308: +4 ~ +20 mA (*2)	Engineering	+4000	+20000	0
	XV310: +4 ~ +20 mA (*3)	Hexadecimal	1999h	7FFFh	0000

(*2/*3): Only the 4 ~ 20 mA of AI supports open or broken wire detection