# CTRIO WORKBENCH, I/O MAP

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HAPTER

# I/O Map Dialog

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The I/O Map dialog panel is used to allocate base controller memory to be used with CTRIO(2) modules. Each module will require unique memory ranges for exchanging data with the base controller. All of the *Direct*LOGIC ladder examples use the "2 ranges" mode Win with the Input Map starting at V2000 and the Output Map starting at V2030.

The I/O Map dialog is accessible from the main Workbench dialog. On the main Workbench dialog, click the button labeled I/O Map.



The I/O Map dialog shows the controller I/O memory used by the CTRIO(2) module, divided into three

groups: Input Functions, Output Functions and System Functions. Just below the Map Display Mode field, you will see tabs labeled Input Functions, Output Functions and System Functions.

Click on the **Input Functions** tab or **Output Functions** tab to display the CTRIO(2) module's assigned input or output functions (quad counter, pulse catch, pulse out, discrete out, etc.). For each input and/or output function assigned, the I/O Map dialog displays the Input Data (CTRIO > Controller) addresses and Output Data (Controller > CTRIO) addresses based on the Map Display Mode and the starting I/O addresses specified (See Chapter 10 for the memory map addresses and offset address tables).

Click on the **System Functions** tab to display the System Functions addressing. The command bits are used when reading from and writing to the CTRIO(2)'s internal registers. The other bits can be used to monitor the status of each individual I/O point on the module.

When using the CTRIO(2) module with a *Direct*LOGIC PLC in "2 ranges" mode, enter the

# I/O Map with DirectLOGIC PLC (2 ranges mode)

NOTE: Do not use "2 ranges" mode with a D2-240 CPU.



starting V memory location for the inputs and outputs in the appropriate fields at the top of the I/O Map dialog. In the I/O Map dialog shown here, note that the Input, Output and Systems Functions addresses shown are in word and bit-of-word formats. Thus, word and bit-of-word addressing will need to be used in the ladder logic program to address the CTRIO(2)'s control and status words/bits.

0 Map	
Map Display Mode FLG: Mapped Addresses (2 range FLC - Mapped Addresses (4 range	Insut Map         Enable Write bPLC         Output Map         Enable Read town PLC           Stering V addees for input:         V2000         Stering V addees for input:         V2000           Range:         V2000 2025         Range:         V2000         V2054           Range:         V2020         Range:         V20254
Input Functions   Output Functions	System Functions
Ch1/Fn1 · Quad Counter	Ch1/Fn2 - Edge Timer
Input Data (CTRI0->Controller)	Input Data (CTRIO->Controller) Input Data (CTRIO->Controller) Input Data (CTRIO->Controller)
V2000.1 = At Reset Value	V2008-2007 - Timer V2008 - Coputer Start V2003 9 - Capture Complete V2003 10 - Timed Du
Output Data (Controller->CTRIO)	Output Data (Controller->CTRIO) Output Data (Controller->CTRIO) Output Data (Controller->CTRIO)
V2054.1 = Reset	V2054 8 = Enable Capture
	OK Cancel Report Export

# I/O Map with DirectLOGIC PLC (4 ranges mode)

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When using the CTRIO(2) module with a *Direct*LOGIC PLC in "4 ranges" mode, enter the starting V-memory location for the *word* inputs and outputs and the starting V-memory location for the *bit* inputs and outputs. Control relays (V40600 range) would usually be used for bit control.

In the I/O Map dialog below, note that Input, Output and Systems Functions addresses shown are in word and Control Relay formats. Thus, word and Control Relay addressing will need to be used in the ladder logic program to address the CTRIO(2) control and status words/bits. Remember that the CTRIO(2) module will consume the address ranges listed in all four range fields.



## I/O Map with DirectLOGIC PLC with CTRIO(2) in ERM/EBC Network

X DL X Win NI When using the CTRIO(2) module with a *Direct*LOGIC PLC in an ERM/EBC network, first configure the ERM network using the ERM Workbench utility. Then, from ERM Workbench, enter the CTRIO(2) module Starting input and output V-Map addresses into CTRIO Workbench I/O Map starting V-memory location for the *bit* inputs and outputs.



**NOTE:** If there is an 8-pt. discrete I/O module preceding the CTRIO module in the EBC base, enter the appropriate starting V-memory bit I/O address in CTRIO Workbench with a V40xxx.8 address as shown in the I/O Map example below (bottom right). This corrects the word offset created by the 8-pt. discrete I/O module. In the example below, note that V40416 Hi(**8**-15) is the starting ERM Workbench CTRIO input V-Map location due to the 8-pt. discrete input module preceding the CTRIO module.



# I/O Map with EBC/WinPLC

X DL V Win NI When using the CTRIO(2) module in an EBC/ WinPLC system (non PLC system), the addressing will be shown as Native EBC/WinPLC addresses or if using Think&Do, the addressing can be shown as Native Think&Do addresses. Just click on the desired mode in the **Map Display Mode** field. The 8-pt module offset described in the note above does not apply to EBC/ WinPLC or EBC/Think&Do systems.



#### I/O Map with an H2-PBC or T1H-PBC \* Profibus DP Controller

When using the CTRIO(2) module with an H2-PBC or T1H-PBC native Profibus addressing will be displayed in the I/O Map as shown below. For the T1H-PBC, the first two output bytes of memory are automatically reserved for the Hot Swap base-rescan feature. The H2-PBC does not support the Hot Swap feature.

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#### H2-PBC I/O Map

#### Creating an Offline File for H2-CTRIO(2)/T1H-CTRIO Module

For the T1H-PBC, enter a 2 byte Output Offset to accommodate memory used by the Hot Swap base-rescan feature. This does not apply to an H2-PBC system. The example shown below assumes the T1H-CTRIO module is the first module in the system.

The CTRIO(2) modules consume 44 bytes of input memory and 52 bytes of output memory. The maximum amount of I/O memory per H2/T1H-PBC station is 244 input bytes and 242

IO Map				≚ out
Map Display Mode	Input Map Starting byte offset for input Range: Range:	ts: 0 Output M Starting b Range: Range:	ap yte offset for outputz:	the / T
Input Functions Output Functions	System Functions			1/0
Output 0 - Pulse (Step)	Output 1 - Pulse (Direction)	Output 2 - Unassigned	Durut 3 - Unassigned	
Input Data (CTRID->Controller)	Input Data (CTRI0->Controller)	Input Data (CTRIO->Controller)	Input Day (CTRI0->Controller)	app
36.1 = Poupul analeti 36.1 = Poupul Suspended 36.4 = Outpul Suspended 36.5 = Dutpul Stalled 36.5 = Comput Stalled 36.5 = Complete				mo
Output Data (Controller->CTRID)	For the T1H-PF	SC enter a 2 hv	te Outnut Offs	et to
18-19 = Command Code 20-21 = Parameter 1 22-23 = Parameter 2 25 = Parameter 3 46.0 = Enable Output 46.1 = Gote Position 46.2 = Suprend Dutput	accommodate n	nemory used by rescan featur	the Hot Swap e.	base-
46.4 = Direction 46.7 = Process Cmd				
	OK Cancel	Report Export		

output bytes. You may need to refer to the Profibus User Manuals (H2-PBC-M / T1H-PBC-M) for information on bytes used by discrete and/or analog I/O modules in order to determine the appropriate Starting input and output byte offset addresses for the CTRIO(2) module.



\*NOTE: T1H-PBC is obsolete as of 08/20. No replacement available.

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### Printing a Memory Map Report

You can print an I/O Memory Map Report from the I/O Map dialog or save as a (.txt) file. Click on the **Report** button located near the bottom of the I/O Map dialog to display the **Memory Map Report** dialog.

Report...

The addresses listed in the Memory Map Report are a combination of the Input Functions, Output Functions and Systems Functions addresses shown in the I/O Map dialog. It is very convenient to have a printed list of the CPU/controller I/O memory used by the CTRIO(2) module while writing the control program.

# Exporting to DirectSOFT

You can export a (.csv) file containing addressing and nicknames used in the I/O Map dialog. Click on the **Export** button located near the bottom of the I/O Map dialog to display the **Export to** *Direct***SOFT** dialog shown below on the left.

Ch1/Fn	r1 - Quad Counter	-
	V2000-2001 = Current Count	
	V2020.1 = At Reset Value	
	V2054.1 = Reset	
Ch1/Fn	12 - Edge Timer	
	V2004-2005 = Previous Time	
	V2006-2007 = Timer	
	V2020.8 = Captured Start	
	v2020.9 = Capture Complete	
	V2054.8 = Enable Capture	
Output	0 - Pulse (Step)	
	V2022.0 = Output Enabled	
	V2022.1 = Position Loaded	-
∢		F
	Save Print Font Close	

The (.csv) file (shown below on right) contains a combination of the Input Functions, Output Functions and Systems Functions addressing and nicknames shown in the I/O Map dialog. This file can be imported into your *Direct*SOFT ladder logic program (*Direct*SOFT>File>Import>Element Documentation).

If you have more than one CTRIO(2) module in a system and intend to create a (.csv) file for more than one module, use the Add Prefix or Add Suffix option to distinguish one module nickname from the others. For example, add prefix or suffix "S1" to identify the CTRIO(2) module nicknames in slot 1.

Export to DirectSOFT	×									
Export Filename										
Browse										
Prefix/Suffix										
NOTE: The exported nicknames are not unique to a specific slot number or module. If you have multiple modules installed and wish to export from more than one module, you will need to specify a unique prefix/suffix.										
If specified, this two character identifier will be added to the beginning or end of each nickname to ensure uniqueness.										
None     O Add Prefix     O Add Suffix										
Unique Slot ID (1 or 2 characters):										
OK Cancel										

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17	1 🔁															
	E1	*   =														
	A	В	C	D		E			F	G			н		1	
1	V2000	C1F1 CurCount	Current I	Count	— Г											
2	B2020.1	C1F1 AtRstVal	At Reset	Value			_									
3	B2054.1	C1F1_Reset	Reset													
4	V2004	C1F2_PrevTime	Previous	Time												
5	V2006	C1F2_Timer	Timer													
6	B2020.8	C1F2 CaptStrt	Captured	d Start												
7	B2020.9	C1F2 CptCmplt	Capture	Complet	0											
8	B2020.10	C1F2_TimedOut	Timed O	ut												
9	82054.8	C1F2_EnablCpt	Enable (	Capture												
10	B2022.0	Out0 OutEnbld	Output E	inabled												
11	B2022.1	Out0 PosLoded	Position	Loaded												
12	B2022.2	Out0 OutSuspd	Output S	Suspende	d											
13	B2022.4	Out0 OutActiv	Output A	scrive												
14	B2022.5	Out0 OutStald	Output S	talled												
15	B2022.6	Out0 CmdError	Crnd Err	or												
16	B2022.7	Out0 CmdCmplt	Crnd Co	mplete												
17	V2040	Out0 CmdCode	Comman	nd Code												
18	V2041	Out0 Param1	Paramet	er 1												
19	V2042	Out0 Param2	Paramet	er 2												
20	V2030	Out0 Param3	Paramet	er 3												
21	B2056.0	Out0 EnablOut	Enable (	Dutput												
22	B2056.1	Out0 GotoPos	Goto Po	sition												
23	B2056.2	Out0 SuspOut	Suspend	Output												
24	B2056.4	Out0 Dirction	Direction													
25	B2056.7	Out0 ProcCmd	Process	Crnd												
26	B2024.6	SysCmdError	SysCmd	Error												
27	B2024.7	SysCmdComplet	SysCmd	Comple	te											
28	B2025.0	Ch1A	Ch1 A													
29	B2025.1	Ch1B	Ch1 B													
30	B2025.2	Ch1C	Ch1 C													
31	B2025.3	ChID	Ch1 D													
30	82026.8	Out Active	Out D Ar	tion												