

CONTROLweb[™]

3U Modular I/O

User Manual

MKS Instruments, Inc. Control & Information Technology Products Group 3350 Scott Blvd Bldg 4 Santa Clara CA 95054

Main: 408.235.7620 Fax: 408.235.7625 Revision 03 02/05



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3350 Scott Blvd Bldg 4 Santa Clara, CA 95054

Preface

About this manual

This manual is designed to serve as a guideline for the installation, set up, operation and basic maintenance of the CONTROLweb[™] Remote I/O Unit. The information contained within this manual, including product specifications, is subject to change without notice. Please observe all safety precautions and use appropriate procedures when handling this product and its related software.



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1 General Information

CONTROLweb[™] is a system for providing high density networked I/O in standard 4U, or customer specific modules. Each system consists of the following components

- NetCom card
- I/O cards
 - Digital
 - o Analog
 - o Interlock
- Card cage with rear and/or side signal distribution

Each node communicates to a master using Modbus/TCP protocol. Setup and data is also available through standard web browser and through the TOOLweb ToolSide Interface (XML over HTTP).



1.1 Theory of Operation

A CONTROLweb unit operates mainly as Ethernet controlled remote I/O. In addition, several features have been added which extend its functionality to provide a unique distributed control architecture and independent monitoring for Fault Detection and Correlation (FDC).

Each of these functions falls under two main technology categories:

CONTROLweb features

- Modbus/TCP slave I/O
- Distributed logic and peer-to-peer control (future)
- I/O diagnostics and manual control

Note: CONTROLweb data is related to raw, **physical** entities. All scaling and logical assignment exists in the module controller which hosts the Modbus/TCP master.

TOOLweb features

- Up to 64 variables for offline and real-time data collection
- Logical names and scaling of selected input points
- Collection plans, with selectable frequency
- Web browser based data plots and download to local host
- XML real-time data streaming for FDC/APC applications

Note: TOOLweb data is **logical**, with all scaling and identification residing on the I/O module.



1.2 CONTROLweb 3U Architecture

The 3U architecture provides a modular approach for creating high density modules of I/O, with combinations of DIDO, AIAO, Serial and Interlock. A card cage hosts these 3U Eurocards, and provides rear and/or side signal distribution using standard or customer specific connection points.

Netcom card is the main processing card:

- Motorola Coldfire 32 bit processor
- Ethernet connectivity and Ethernet switch
- 4 UART's with s/w selectable RS232/485 functionality
- Internal CAN bus controller, for plug-and-play I/O

I/O Cards:

- CDN491-C-E Digital I/O Card
 - o 48 in/out points
 - o Each point in/out
 - o 24V, active low
- CDN496-C-E Analog I/O Card
 - o 32 analog in, 16 analog out
 - 12 bit, single ended
- CDN497-C-E (Part of CDN500-x-C-E)
 - o Interlock Card, dual slot
 - o 36 68 Relays
 - 8 32 DIDO







CONTROLweb 3U Functional Architecture





2 Installation & Setup

The base operation of a CONTROLweb 3U unit, is to provide remote, slave I/O to a control system. This section describes electrical installation and software configuration to provide operation of I/O.

2.1 CONTROLweb Interface Description

Installation instructions will be based upon a standard configuration of modules:

Part Number Description		Slot
AS00482-02	Card cage, 4U, 4 I/O Slots	0
CDN491-C-E	Card, DIDO	1
CDN496-C-E	Card, AIAO	2
CDN500-x-C-E	Card, Interlock	3

<u>Interfaces</u> Ethernet Interface – Monitor Serial Port – Monitor	Interfaces LED indicators Interlock status – scrolling
Power input – DC Com 1 I/O connectors	Ethernet Interface – Control I/O connectors
Com 2, Com 3	Com 4

2.2 Mechanical Installation

Install all cards into their correct slots.

Note, card cage can be configured for any combination of I/O cards. Zero ohm resistors are located on the backplane to route the correct power for each type of card. Contact an MKS application engineer for details.

Mount card cage using the 4 front, slotted mounting holes.

Ensure proper ventilation of cage. Air flow moves from bottom (fan tray) to top (perforated cover). Keep at least 1" open on top and bottom of the cage. For thermal verification, running temperature of cards can be monitored from the web based interface.







2.3 Electrical Installation

2.3.1 Power Wiring

Power connector provides inputs for 24, +15, -15 VDC.

Cage Connector: AMP Mate-n-Lok # 194018-1

Mating Connector:AMP Mate-n-Lok # 770016-1Pins:AMP Socket # 770251-3

Power Connector Pinout

Pin	Description
1	+24V IN
2	24V COMM
3	+15V IN
4	15V COMM
5	-15V IN

2.3.2 I/O Wiring

Each I/O card slot is assigned to (2) rear signal distribution connectors. Use the below pinouts, in conjunction with the manual for each I/O card, which designates the electrical specifications for that card.

Cage Connector: AMP 748831-1

Mating Connector:





AIAO Signals

	SIGNAL	NAME				SIGNAL N	IAME	S	IGNAL N	AME				:	SIGNAL	NAME
	1 1	NODE NAME	PIN NAME	PIN NAME	NODE NAM	E I			NO	DE NAME	PIN NAME	PIN	NAME	NODE NAME	1	
BUSS NAME	3	1	1	J3 I	1					1	I J4		1	1		BUSS NAME
1	\vee						BUSS NAME	BUSS NAM	E							1
		\checkmark	\vee	\checkmark	\vee	\vee			\vee	\vee	\vee		\vee	\vee	\checkmark	
\checkmark	+15V	F22-2	1		C.12-9D	STGCOMM			+15V	F25-2	1 -		40	CJ2-17B	SIGCOMM	$\downarrow \vee$
	15COMM	W22-2			J2-20D-J3-60	AO 3	\checkmark	\checkmark	15COMM	W22-2		0-	40 C0 CJ	2-18B-J4-60	AO 11	
					12-14D-13-41	AT 12					(0-0-		2-10E-14-41	AT 28	
-15V 🛠—	CT COMM	C 12 0B	2 ($- 41^{\circ}$	E24.2	. 157		-15V 🛠 –	CTOCOM	012.125	20	0	41 00	E07.0	AL 20	
	15 COMP	0J2-5D	22	0 0 61	10 4 45 10 40	+15V			1 COMM	0J2-13E	22	$^{\circ}$ O	61	FZT-2	+15V	
	15COMM	<u>VV22-2</u>	3 (JZ-14E-J3-4Z	AI I3			15COMM	<u>VVZZ-Z</u>	3 0	<u> </u>	42 00	2-0A-J4-42	AI 29	
	AL 6	CJ2-15C-	J3-23 23	62			->>-15V		AI 22	CJ2-11D-	14-23 23	റ്റ-	62			
	SIGCOMM	CJ2-9A	4	43	F23-2	+15V	// 101		SIGCOMM	CJ2-13B	4 0	\sim	43	F26-2	+15V	// 101
	AI 7	CJ2-15D-	J3-24 24	63	W22-2	15COMM			AI 23	CJ2-11E-J	4-24 24		63	W22-2	15COMM	
	AI 0	CJ2-16B-	J3-5 5 /	44			X		AI 16	CJ2-12C-	4-5 5		44			N and
	+15V	F23-2	25	64	CJ2-13A	SIGCOMM	W -15V		+15V	F26-2	25		64	CJ2-17D	SIGCOMM	<i>W</i> -15V
	AI 1	CJ2-16C-	J3-6 6	-0 0 45	W22-2	15COMM			AI 17	CJ2-12D-	4-6 6	ົ້	45	W22-2	15COMM	
			20		12-20E-13-65	AO 4					0 0	0	65 CJ	2-18C-14-65	AO 12	
-15V 代—	±15V	E22-2	26		C.12-9D	STOCOMM		-15V < –	+15V	F25-2	- 20 (0-0-	65 00	C.I2-17B	10 11	
	1ECOMM	W22.2	($- \frac{46}{5}$	12 104 13 66	AO E			1 ECOMM	W22.2	<u> </u>	0	46	2 180 14 66	10 12	
	ISCOUNT	1122-2	27	-0 0 66 C	12 124 12 47	AC 5			1 SCOMP	1122-2	27	0 0-	66 05	2-100-34-00	AC 15	
-15V 📿 –		0.10.00	8 ($3^{-}0^{-}47^{-}$	JZ-12A-JJ-47	AL 14		-15V 📿 –	07.000104			0	47 00	2-00-34-47	AL SU	
		CJ2-9C	28	67	F24-2	+15V			SIGCOMM	CJ2-1/A	28	റ്റ	67	F27-2	+15V	
	15COMM	VV22-2	9 (J2-12B-J3-48	AI 15			15COMM	W22-2	9 0	\sim	48 CJ	2-8C-J4-48	AI 31	
	AI 8	CJ2-15E-	J3-29 ₂₉	68			N-15V		AI 24	CJ2-10A-J	4-29 29	$\sim \sim$	68			N-15V
	SIGCOMM	CJ2-9A	10	49	F24-2	+15V	//-104		SIGCOMM	CJ2-13C	10	~~	49	F27-2	+15V	//=104
	AI 9	CJ2-14A-	J3-30 30	69	W22-2	15COMM			AI 25	CJ2-10B-J	4-30 30		69	W22-2	15COMM	
	AI 2	CJ2-16D-	J3-11 11	50			N		AI 18	CJ2-12E-J	4-11 11		50			N
	+15V	F23-2	31		CJ2-13A		- ≫ -15V		+15V	F26-2	31	\sim	70	CJ2-17E	SIGCOMM	→-15V
	AT 3	CJ2-16E-	3-12 12	0 0 51	W22-2	15COMM			AT 19	CJ2-11A-	4-12 12	0_0-	51	W22-2	15COMM	
			22	$ \frac{31}{710}$	12-19B-13-71	AO 6					22 0	0	74 C.I	2-18F-14-71	AO 14	
-15V 代—	+1 EV	F22-2	32		C 12-9E	CTCCOMM		-15V 🔇 –	+1EV	F25-2	32 (0-0-	/1 00	0.12-170	CTCCOM	
	1500000	W22-2	13	$- \frac{52}{2}$	12-190-13-72	31000000			1500MM	W22-2	13 0	0	52	002 110	30 1F	
	TECOMM	1122-2	33	$-0 0 \frac{12}{2}$	12 204 12 52	AO 7			TECOMM	1122-2	33 (0 0-	12 0	2-16A-J4-72	AO 15	
-15V 🛠 —	aracohn	0 10 00	14 (5^{-}	JZ-20A-JJ-JJ	AO 0		-15V 🛠 –	aracola	C 12 17A	14 0	0-	53 00	2-150-54-55	AU 8	
	SIGCOMM	032-90	34			KE1			SIGCOMM	0J2-17A	34	$\tilde{0}$	73			>>+24∨
	15COMM	VV22-2	15		J2-20B-J3-54	AO I			15COMM	<u>vv22-2</u>	15		54 UJ	Z-19E-J4-54	AO 9	
	AI 10	CJ2-14B-	J3-35 35	74			->>+24V		AI 26	CJ2-10C-	4-35 35	പ്പ	Z4 KE	ζ		
	SIGCOMM	CJ2-9B	16	<u>55</u>	F24-2	+15V	11		SIGCOMM	CJ2-13D	16	\sim	55	F27-2	+15V	
	AI 11	CJ2-14C-	J3-36 36	75		KEY			AI 27	CJ2-10D-J	14-36 36	$\sim \sim$	75			N+24V
	AI 4	CJ2-15A-	J3-17 17				X 45V		AI 20	CJ2-11B-J	4-17 17	<u>س</u> رر	56			K 151
	+15V	F23-2	37	0 76			X-10V		+15V	F26-2	37		76			
	AI 5	CJ2-15B-	J3-18 18	57	W22-2	15COMM	// +24V		AI 21	CJ2-11C-	4-18 18	ງິດ-	57 KEI	W22-2	15COMM	
			20	77			h.				20 0	0	77			- h.
-15V 🔨 –	+15V	F22-2	10		C.12-9E	STGCOMM	10	-15V 🔨 –	+15V	F25-2	10 -	0_0-	<i>E</i> 0	C.I2-17C	SIGCOMM	
	15COMM	W22-2	19			020001111			15COMM	W22-2		0	30		Drocom	
	LOCOPHY		39	-0 $0 + \frac{78}{18}$	12-200-13-59	NO 2	10		TOCOUL		39 (0 0-	/8 50 CI	2-184-14-59	AO 10	
-15V 🛠—			20 (-59°	02 200-00-03	AU 4	P	-15V 🛠 –			20 0	0-	59 00	2 10/104-00	A0 10	- P
											-		J			
											\subseteq					

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2.3.3 Com Port Configuration

There are 4 available serial communication ports. Each is s/w selectable for RS232/485. Use web browser configuration for all serial port settings.



2.3.4 Ethernet Connector

CONTROLweb 3U contains a single 100BT Ethernet controller, and an Ethernet switch. The rear connector has highest priority, and is intended for all control functions. The front connector, located on the Netcom card, is intended for monitoring functions.





2.4 NetCom Card

The Netcom card is the main processor of the 3U Ethernet I/O system. Netcom manages all connectivity with the master controller, controls all I/O functions and provides a user interface through a built-in web browser.



Interfaces

Status LED – Local Module Status LED – Remote Network

Ethernet Port – Monitoring

Status LED's – Front Ethernet Status LED's – Rear Ethernet

Serial Port - Monitor





2.4.1 IP Address Rotary Switches

IP Address Rotary Switches

IP0, IP1, IP2 - These three decimal digits form a number between 0 to 999 which specifies the last two network segments.

Example: 192.168.y.x

0 - Use automatic IP address configuration using DHCP protocol 1 - 999 - Set the IP address to 192.168.y.x

```
w = current setting of the three switches
x = w mod 256
y = floor( w / 256)
```

for example, if the three rotary switches are set to 770, the IP address will be set to 192.168.3.2

The netmask will always be set to 255.255.255.0, and the default gateway will be configured so that the first three numbers equal those of the IP address, and the last equals to "1", in the above example the gateway will be set to 192.168.3.1

NOTE: Some combinations of the rotary switch settings may yield to illegal IP address setting, e.g. addresses reserved to local broadcast addresses. Such combination should be avoided. For example, 192.168.0.255 is a reserved address, hence the setting of "255" on the rotary switches must be avoided.

2.4.2 Operation Mode Rotary Switch

All <u>even</u> mode numbers enable the three IP address switches, and allow them to override the current non-volatile memory settings

All <u>odd</u> mode values, lead to using the non-volatile memory setting instead of the switches.

- Mode 0,1 Normal Production Operation Mode, Diagnostics disabled, Network Watch-Dog Enabled
- Mode 2,3 Field diagnostic mode, Normal operation with Watch-Dog, Diagnostics disabled
- Mode 4,5 Not Defined
- Mode 6,7 Not Defined
- Mode 8,9 Manual Configuration mode.

When the Mode switch is set to "9" and the IP address switches are set to "000", the factory configuration parameters, serial number, Ethernet hardware address can be changed.



2.4.3 Indicator LEDs

LOCAL STATUS "LOC"

Off	-	Power Off
Steady Green	-	Not Used
Blinking Green	-	Normal Operation
Green-Amber	-	Local Auto-Configuration in progress
Solid Amber	-	Software initialization in progress
Blinking Amber	-	Self-Diagnostics in progress
Green-Red	-	Thermal Warning
Amber-Red	-	Internal Communication Failure
Blinking Red	-	Safety Warning / Interlock Failure

REMOTE STATUS "REM"

Off	-	Power off, unit self-test
Steady Green	-	Not Used
Blinking Green	-	Network Good, Master Connected, Watch-Dog Enabled
Green-Amber	-	Network Good, Master Connected, Watch-Dog Disabled
Solid Amber	-	Network Good, Waiting for Master to connect
Blinking Amber	-	Network Configuration Error: Wrong IP address, no other network devices
Green-Red	-	Network Auto-Configuration In Progress
Amber-Red	-	Network interface internal error
Blinking Red	-	Not Used (Safety Warning)



3 Quick-Start

This section provides a quick method to connect to a CONTROLweb 3U I/O module, and manually turn on a digital output, through the web browser interface.

1. Modify your network TCP/IP settings to match the following:

PC IP Address:	192.168.1.1
PC Netmask:	255.255.255.0

eneral	
/ou can get IP settings assigned au his capability. Otherwise, you need t he appropriate IP settings.	omatically if your network supports o ask your network administrator for
Obtain an IP address automatic Obset the following IP address	ally
IP address:	192.168.2.1
Sybnet mask:	255 . 255 . 255 . 0
Default gateway:	
O <u>b</u> tain DNS server address aut	tomatically
Use the following DNS server a	addresses:
Preferred DNS server:	· · · · ·
Alternate DNS server:	
	Ad <u>v</u> anced

- Set the IP Address of the CONTROLweb 3U unit to be 192.168.1.2 and Mode for user diagnostics. This is done by setting the Mode Switch to 2, and the IP Address Switches to 2 5 8 (sets last 2 network segments as .1 .2).
- 3. Start up a web browser and point it to **192.168.1.2**. You will see the main CONTROLweb configuration page, showing an overview of the cards in the unit, and status







4. Click on the link to Digital Output access.

🕘 http://	/10.112.0	0.131 - S	lot 3 DO 1	-32 - Mic	rosoft Int	ernet Ex	. 💶 🗖	×					
	Slot 3 Discrete Outputs												
1	2	3	4	5	6	7	8						
0 💌	0 💌	0 💌	0 💌	0 💌	0 💌	0 💌	0 💌						
9	10	11	12	13	14	15	16						
0 💌	0 💌	0 💙	0 💌	0 💌	0 💌	0 💌	0 💌						
17	18	19	20	21	22	23	24						
0 💌	0 💌	0 💌	0 💌	0 💌	0 💌	0 💌	0 💌						
25	26	27	28	29	30	31	32						
0 💌	0 💌	0 💌	0 💌	0 💌	0 💌	0 💌	0 💌						
Bl	ink Output	None	~	Auto	-Refresh [Refre	sh						
								V					
ど Done						Internet							

5. Change an output state by writing a 1 to that location. Note, LED on the DIDO card for that channel, will turn green.

4 CONTROLweb[™] User Interface

The user interface is web based. You can access it by simply browsing to the IP-Address of the CONTROLweb node.

Note

Microsoft Internet Explorer versions less than 5.5 may not function as expected due to limitations of the browser.

The main page of the CONTROLweb unit shows a top view of the module. This is referenced as the Device tab.

- I/O cards installed are shown in the center of the page.
- Netcom CPU status is shown on the right side of the page. (dynamic)
- Bottom toolbar shows module main clock and status. (dynamic)

CONTROLweb I/O Rack - Microsoft Inter	net Explorer					
<u>File E</u> dit <u>V</u> iew F <u>a</u> vorites <u>T</u> ools <u>H</u> elp						
🌀 Back 🔹 🐑 - 💌 😰 🏠 🔎	Search 👷 Favorites 🥝 🖉	3• 🎍 🖃 📒	🇱 🏟 🇏	8		
ddress 🕘 http://10.112.0.124/						💌 🔁 Go 🛛 Li
Google - 🛛 😽 Se	earch Web 🔹 🚿 🎴 PageRank 🗗	18 blocked 📲 AutoF	🛛 🛃 Options 🦼	•		
mks						CONTROL
Device Config	juration				TOOLweb	help
Controller Model S Version 0 Serial# 1 Operating Mode IP Switch Fan Speed (RPM) Backplane Status Baud Rate (dops) Modbus Connects Avg. Ops/sec	00478 96 R 11239 2 000 5340 0K 1000 0		T T L L C C C C C	Soft 2 Soft 2 Model CUM496CE Version 1.03384 Scriatif N/A Scriatif Nontro 255 Scriatif Nontro Scriatif Nontro Scriatif Nontro Scriatif Nontro Scriatif Scrit Scrit	SI01 3 CONS 0026 1.010074 N/A 25 1 72 1 32	
	_	Costol Doot	_			
	Port 1	2	3	4		
	Protocol Raw TCP	Raw TCP	Raw TCP	Raw TCP		
	Client IP –	Not connected	Not connecte	a Not Connected	-	
	Bytex Tx/Rx 0/0	0/0	0/0	0/0	1	
	URL <u>10001</u>	10002	10003	10004]	
NETCOM S/II 111239	Setup		2005/02/24	19:59:08 UTC		@ 2003-2005, MKS Instrume
						A Tabana A



4.1 I/O User Interface

By selecting I/O of interest from the main page, a pop-up will appear for each section of I/O.

- Inputs can be read. (dynamic)
- Outputs can be set manually, in Netcom mode 2 or 3 only. (dynamic)

🗿 http://10.112.0.131 - Slot 3 DO 1-32 - Microsoft Internet Ex 🔳 🗖 🔀												
Slot 3 Discrete Outputs												
1	2	3	4	5	6	7	8					
0 💌	0 💌	0 💌	0 💌	0 💌	0 💌	0 💌	0 💌					
9	10	11	12	13	14	15	16					
0 💌	0 💌	0 💌	0 💌	0 💌	0 💌	0 💌	0 💌					
17	18	19	20	21	22	23	24					
0 💌	0 💌	0 💌	0 💌	0 💌	0 💌	0 💌	0 💌					
25	26	27	28	29	30	31	32					
0 💌	0 💌	0 💌	0 💌	0 💌	0 💌	0 💌	0 💌					
Bli	ink Output	None	~	Auto	Refresh	Refre	sh					
								V				
🕘 Done						Internet						

🗿 http://10.112.0.131 - Slot 3 DI 1 🔳 🗖 🔯									
	Slot 3 Discrete Inputs								
1	2	3	4	5	6	7	8		
0	0	0	0	0	0	0	0		
9	10	11	12	13	14	15	16		
0	0	0	0	0	0	0	0		
17	18	19	20	21	22	23	24		
0	0	0	0	0	0	0	0		
25	26	27	28	29	30	31	32		
0	0	0	0	0	0	0	0		
Auto-Refresh 🗌 Refresh									
								V	
🙆 Don	e			0	Interne	et			

4.2 Communication Port Interface

Click on a port to establish communication using your local Telnet server.

			Serial Port	s		
	Port	1	2	3	4	
	Protocol	Raw TCP	Raw TCP	Raw TCP	Raw TCP	
	Status	Not Connected	Not Connected	Not Connected	Not Connected	
	Client IP	-	-	-	-	
	Bytex Tx/Rx	0/0	0/0	0/0	0/0	
	URL	10001	10002	10003	10004	
						×.
IETCOM S/II 111239		Setup		2005/02/24 1	9:59:08 UTC	@ 2003-2005, MKS Instruments, Inc.
🕘 Done						😵 Internet



A serial communication session will be established which allows you to communicate to connected serial devices:

% 10.112.0.124 -	HyperTermina	l					
Ele Edit Yew Call	Iransfer Help						
🗅 🚔 🍵 🏅 🗉	b 🎦 🔂						
Connected 0:00:04	Auto detect	TCP/IP		Capture	Print echo		



4.3 Module Configuration

The Configuration tab provides access to all configurable settings for the module. This includes:

- Modbus/TCP Data Mapping
- Serial port settings
- TOOLweb control access
- TOOLweb I/O bindings

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Note

Changes to configuration can only happen in Netcom mode 2,3 AND you must gain access within the first 60 seconds after system boot. Changes are locked-out after 60 seconds.



Main Configuration Page

4.3.1 Modbus/TCP Data Mapping

Since CONTROLweb 3U is a modular i/o system, the Modbus/TCP mapping is dynamic, based upon the card content of each system. To see the mapping details, select Modbus Data Mapping:



Modbus Data Mapping									
Data Type Reference Quantity Description									
Input Reg	10001	4	Time 32 bit sec, 32 bit usec BB						
Input Reg	513	32	Slot 2 AI						
Holding Reg	513	16	Slot 2 AO						
Holding Reg	663	32	Slot 2 AI Shadow						
Input	769	72	Slot 3 DI						
Coil	769	32	Slot 3 DO						
Holding Reg	897	5	Slot 3 DIDO Combined						

4.3.2 Serial Port Settings

	Serial Port Status										
Port Protocol Physical Baudrate # bits Parity Bytes In/Out Peer Addr											
сом1	Raw TCP 🔽	RS232 No Flow Control 💌	38400 💌	8 🛩	None 🔽	Not Connected					
сом2	Raw TCP 🔽	RS232 No Flow Control 💌	38400 💌	8 💙	None 💌	Not Connected					
сомз	Raw TCP 🔽	RS232 No Flow Control 💌	38400 💌	8 🕶	None 💌	Not Connected					
сом4	Raw TCP 🔽	RS232 No Flow Control 💌	38400 💌	8 🗸	None 💌	Not Connected					



5 Modbus/TCP Interface

Use the Modbus mapping details provided through the web browser interface under the Configuration tab. Manual, section 4.2.1.

Map this data in your Modbus/TCP scanner.

For more details, see http://www.modbus.org.



6 TOOLweb Interface

TOOLweb is a system-wide program for enabling and gathering real time data from all parts of a process, and providing this data to factory based modules for analysis, FDC and APC.

CONTROLweb modules utilize TOOLweb functionality for the following:

- Web based tools for data analysis and debug, directly from the I/O module
- Real time data acquisition, using XML over HTTP

6.1 TOOLweb User Interface

TOOLweb functions are accessed and configured through the web browser interface. Users must determine the I/O points of interest, those usually referred to as Key Process Variables. Once these variables are named and scaled, they are available for data collection and analysis.

6.1.1 Control Access

Create the allowed permissions to process data.

ToolWeb Write Access Control					
Access Control Any Controller Allowed					
Designated Controller IP Address	0.0.0.0				
Your IP Address	10.112.0.103:1188				
CONFIGURATI	ON ACCESS DENIED				

6.1.2 I/O Bindings

Select the I/O points which will be available for TOOLweb functions. Each point is selected, given a description, and scaled to meaningful process units.

The list can be 1 - 64 variables.





6.1.3 Data Collection Plans

A data collection plan selects the process variables of interest, and the frequency of data collection. Each collection plan can then be viewed using a Charting Applet, or can be downloaded in CSV format to your local PC.





6.1.4 Data Collection Plan Editing

Create a collection plan, and select the key process variables of interest:

Edit Collection Plan #0								
Name:	Default_CP							
Interval (ms):	500							
Logging:	127 Entries 💌							
Active:								
Variables:	0: Up time 200: VCC5 201: VCC3 202: VCC24							
	Apply							

6.1.5 Charting Applet

Once a data collection plan is configured, you can view the data using a built-in charting applet.





6.1.6 Download Data to Local PC

Collection plan data can also be downloaded in CSV format:

×	Mic	crosoft	Excel	cpda	ta[1]														
:8) E	jie <u>E</u> d	it ⊻jew	Inse	rt Format	Tools	Data <u>Wi</u> nd	iow <u>H</u> elp	Adobe Pl	DF						Ty	/pe a questio	on for help	8×
÷ n	1 17	2 🖬			a 1499 69		PR + 3	10 - 0	- I 🔍	Σ - 41 3	1100 🔊	100%		10 - B		\$ *:0	.00 1 20		A - "
					<u></u>	5 US			. 69	- 24 /						1 4 .00			-
: 12	9.1	8	Ŧ																
		A1	-)	Collecti	on Plan: D)efault_CP	Period 50	0 millised	conds									
	-	A	В	C	D	E	F	G	Н		J	K	L	M	N	0	P	Q	R
1	-	Cine e	S		VID 200	VID 201	1/10 202	VID 244	VID 242	VID 242	VID 244	1/10 222	1/10 222	VID 224	VID 225	VID 226	VID 227	Action Plan	Default
-2	5	7:51 D	3eq 11734	5846	VID_200	VID_201	0.02	VID_211	0.004	VID_213	4.88E-05	VID_222	VID_223	VID_224	VID_225	-0.009	VID_227	-0.004	VID_225
4	5	7:51.5	11735	5846	ň	n n	0.02	ň	0.004	n n	4.00L-05	ň	ň	0 004	0	0.005	ň	-0.004	0
5	5	7:52.0	11736	5847	0.004	ŏ	0.02	0.004	0.001	ŏ	ŏ	-0.004	ŏ	0.001	ŏ	ŏ	ŏ	-0.009	ŏ
6	5	7:52.5	11737	5847	0	0.004	0	0	ō	ō	ō	-0.004	ō	ō	ō	ō	0.004	0	Ō
7	5	7:53.0	11738	5848	0	0	0	0	0	0	0	-0.004	0	0	0	0	0	0	0
8	57	7:53.5	11739	5848	0	0.004	0.02	0	0	0	0	0	0	0.004	0	-0.004	0	0	0
9	57	7:54.0	11740	5849	0.004	0.004	0.02	0	0.004	0.004	0	-0.004	-0.004	0	0	-0.009	0	0	0
10	5	7:54.5	11741	5849	0.009	0.004	0	0	0	0	0	0	0	0	0	0	0.004	0	0
11	5	7:55.0	11742	5850	0.004	0.004	0.02	0	0	0	0	-0.004	0	0.004	0	0	0	0	0
12	5	7:55.5	11743	5850	0.004	0.004	0.00	U	U	U	1005.05	0.004	U	0.004	0.000	U	0.004	U	0.004
13	5	7:56.U	11744	5051	0	0.004	0.02	0	0	U 0	4.885-05	-0.004	0	0.004	-0.009	0.004	0.004	0	-0.004
14	5	7:57.0	11745	5852	0.004	0.004	0.02	0	0	0	-4.00L-00	-0.004	0	0.004	0.004	-0.004	0	0	-0.004
16	5	7:57.5	11747	5852	0.004	0.004	0.02	ň	0.004	n n	ň	-0.004 Π	ň	0.004	-0.009	ň	ň	ň	-0.004
17	5	7:58.0	11748	5853	0.001	0.004	ŏ	ŏ	0.004	ŏ	ŏ	ŏ	ŏ	ŏ	0.000	ŏ	0.004	ŏ	-0.004
18	5	7:58.5	11749	5853	0.004	0.004	0.02	0.004	0	0	0	0	0	0	0	0	0	0	0
19	5	7:59.0	11750	5854	0.004	0.004	0.02	0	0	0	4.88E-05	0	0	0	0	0	0	-0.009	0
20	57	7:59.5	11751	5854	0.004	0.004	0.02	0.004	0	0.004	0	0	0	0.004	0	0	0	0	-0.004
21	58	8:00.0	11752	5855	0.004	0	0.02	0	0	0	0	-0.009	0	0.004	0	0	0	0	0
22	58	8:00.5	11753	5855	0.004	0	0	0	0.004	0.004	0	-0.004	0	0.004	0	0	0.004	0	0
23	58	8:01.0	11754	5856	0.004	0	0	0.004	0	0.004	0	0	0	0.004	0	-0.004	0	0	0
24	50	8:01.5	11755	5855	0.004	0	0.02	0.004	0.004	U	0	0.004	0	0	U	U 0	0.004	0.000	U U
25	50	0.02.0 8:02.5	11757	5857	0.004	0	0.02	0.004	0.004	0	0	-0.004	0	0	0	0	0.004	-0.009	0
20	5	8:03.0	11758	5858	0.004 N	0	0.02	0 004	0	0 004	0	-0.004 N	0	0	0	0	0	0	n
28	58	8:03.5	11759	5858	ŏ	0.004	0.02	0	0.004	0.004	ŏ	ŏ	ŏ	ŏ	õ	ŏ	Ő	Ő	-0.009
29	58	8:04.0	11760	5859	0.004	0.004	0	0.004	0	0.004	Ō	-0.004	Ō	0.004	Ō	-0.004	Ō	Ō	0
30	58	8:04.5	11761	5859	0.004	0	0.02	0	0	0	4.88E-05	0	0.004	0	0	-0.004	0	0	-0.009
31	58	8:05.0	11762	5860	0	0	0.02	0.004	0	0	0	0	0	0	0	0	0	0	0
32	58	8:05.5	11763	5860	0.004	0.004	0.02	0	0.004	0	0	0	0.004	0	0	-0.004	0	0	-0.009
33	58	8:06.0	11764	5861	0.004	0.004	0	0	0	0.004	-4.88E-05	-0.004	0	-0.004	0	0.004	0	0	0 🗸
H ·	• •	• н\с	pdata	1/									<			J			>
Rea	dy																		



6.2 TOOLweb Toolside Interface

TOOLweb interface is relevant when a SenseLink[™] is connected to a BlueBox in a Semiconductor process tool APC and e-diagnostic system.

The following messages are supported via the TOOLweb[™] ToolSide Interface:

Message	Supported
CapabilitiesRequest/Response	Yes
Polling	Yes
Tracing	Yes
Bulktrace	No
Events	No
ControlParameter	Yes
SetRequest/Response	No

The names and units as exposed in the CapabilitesResponse are the same as defined in the channel configuration.

Reference the BlueBox Manual for additional details on operating SenseLink[™] with BlueBox.



Appendix A - CONTROLweb SPECIFICATIONS

Processor

CPU	
Memory	y
Flash	

32-bit Motorola Coldfire 8MB SDRAM 2MB

Communications

Ethernet Port

RS232 Port

Ethernet Switch

RS232/485 Ports

100BaseT, RJ45 connector with EMI filter, LED indicators
100BT
TXD, RXD, RTS, CTS signals; DB9 connector
S/W selectable RS232 (TXD, RXD) or RS485
Serial Baud Rates 300bps to 115Kbps (38.4Kbps maximum with all 3 ports operating continuously).

General

Power Supply	18VDC to 28VDC
Power Consumption	10W minimum + I/O card requirements
Operating Temperature	0C to 50C
Storage Temperature	-20C to 85C
CE	pending



Appendix B – Interlock Card I/O Mapping

Each interlock card represents a total of 72 inputs and 32 outputs. For complete details, see the manuals for CDN497 and CDN498. The table below shows a summary of resources for a complete dual slot interlock card, CDN500-x.

Interlock Card Resources

	DIO	R _{IN} , DPDT	R _{OUT} , DPDT	Uncomitted I/O Pins on J2 connector
CDN497	8 sourcing (1-8)	24 with readback	12	40
CDN498	24 sinking (9-32)	16 with readback	16	32
TOTAL	32	40	28	72

Input Map

Input	Resource	Location
1 – 8	DIO 1 - 8	CDN497
9 – 32	R _{IN} 1 - 24	CDN497
33 – 56	DIO 9 - 32	CDN498
57 - 72	R _{IN} 1 - 16	CDN498

Output Map

Output	Resource	Location
1 – 8	DIO 1 - 8	CDN497
9 – 32	DIO 9 - 32	CDN498



WARRANTY

MKS Instruments, Inc. (**MKS**) warrants that for two years from the date of shipment the equipment described above (the "equipment") manufactured by **MKS** shall be free from defects in materials and workmanship and will correctly perform all date-related operations, including without limitation accepting data entry, sequencing, sorting, comparing, and reporting, regardless of the date the operation is performed or the date involved in the operation, provided that, if the equipment exchanges data or is otherwise used with equipment, software, or other products of others, such products of others themselves correctly perform all date-related operations and store and transmit dates and date-related data in a format compatible with **MKS** equipment. THIS WARRANTY IS **MKS**' SOLE WARRANTY CONCERNING DATE-RELATED OPERATIONS.

For the period commencing with the date of shipment of this equipment and ending two years later, **MKS** will, at its option, either repair or replace any part which is defective in materials or workmanship or with respect to the date-related operations warranty without charge to the purchaser. The foregoing shall constitute the exclusive and sole remedy of the purchaser for any breach by **MKS** of this warranty.

The purchaser, before returning any equipment covered by this warranty, which is asserted to be defective by the purchaser, shall make specific written arrangements with respect to the responsibility for shipping the equipment and handling any other incidental charges with the **MKS** sales representative or distributor from which the equipment was purchased or, in the case of a direct purchase from **MKS**, with the **MKS-CIT** home office in Santa Clara, CA

This warranty does not apply to any equipment, which has not been installed and used in accordance with the specifications recommended by **MKS** for the proper and normal use of the equipment. **MKS** shall not be liable under any circumstances for indirect, special, consequential, or incidental damages in connection with, or arising out of, the sale, performance, or use of the equipment covered by this warranty.

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