Using KEPServerEX OPC Server (Kepware) with the ioLogik E2210

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In this Technical Note, we cover the following topics:

- 1. Obtaining Modbus addresses from the ioLogik E2210 configuration file
- 2. Configuring KEPServerEX OPC Server (Kepware) with the ioLogik E2210

1. Obtaining Modbus addresses from the ioLogik E2210 configuration file

1.1 In order to use the ioLogik E2210 with KEPServerEX OPC Server (Kepware), you will need to obtain the Modbus addresses of each input and output channel that you wish to access. The Modbus address can be obtained by exporting the system configuration.

Run ioAdmin by clicking Start-> Program Files -> ioLogik -> Utility -> ioAdmin. In the left panel, right click on the ioLogik E2210 whose address table you wish to export, and then select Export System Config to save the configuration file.



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1.2 The exported system configuration will appear as follows. This table can be used to retrieve the ioLogik E2210 system, I/O configuration, and Modbus address table.

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File Edit	Format View Help		
ioLogi	k 2000 Network I∕o S€	erver Configuration	
Date:	6/16/2006		
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1. 1900			
E2210	Ethernet I/O Server 1	L2DI, 8DO(sink)	
2. Sys	tem and I/O Configura	ations	
Sys	IP=192.168.127.254, Communication Watch	, NM=255.255.255.0, o ndog=Disable, Timeout	3W=0.0.0.0, MAC=00-90-E8-0C-C1-F6 t: 0 sec
DIOO	Counter PWF	R ON=Stop, Safe Statu	us=Stop, Filter=50.00ms, Trigger=Lo to Hi
DI01	DI –n,	/a-	una encontrational denominational entrational construction denominations and the second denomination of the s
D102	DI	/a-	
DT04	DT -n	/a-	
DIOS	DI -n/	/a-	
DI06	DI –n,	/a-	
DI07	DI –n,	/a-	
DI08	DI –n,	/a-	
DI09	DI –n,	/a-	
DI10	DI -n,	a-	
DODO		/a- 2 ON-Stop Safo Statu	us-Stop Low-0 Some High-0 Some
DO00	DO PWP CN-OFF	safe status=Off	us=scop, cow=0.jums, mign=0.jums
DOUZ	DO PWR ON=OFF.	Safe status=Off	
D003	DO PWR ON=OFF.	Safe status=Off	
DO04	DO PWR ON=OFF,	Safe status=Off	
DO05	DO PWR ON=OFF,	, Safe status=Off	
D006	DO PWR ON=Off,	, Sate status=Off	
DOU7	DO PWR ON=OTT,	, Sare status=Off	
3. Mod	bus address table)		
Channe	l No. I∕O tγpe	Modbus reference	ce Modbus address (Dec, Hex)
DIOO	Input	30001	0000, 0×0000
DI01	Input	10002	0001, 0×0001
0102	Input	10003	0002, 0x0002
DIUS	Input	10004	0003, 020003
DT04	Input	10005	0004, 00004
DT06	Input	10007	0006. 0x0006
DI07	Input	10008	0007. 0x0007
DI08	Input	10009	0008, 0×0008
DI09	Input	10010	0009, 0×0009
DI10	Input	10011	0010, 0×000A
DT11	Toput	10012	0011, 0×000B
D000	Output	40001	0000, 0x0000
DOUT	Output	00002	0001, 0X0001
0002	σατράτ	00003	0002, 0X0002
<			

You will use the information in the configuration file to determine each channel's Modbus address. In the second section of the file, you can obtain information on each channel's configuration. From the configuration file shown on the previous page, we obtain the following information on digital input channels 00 and 01 and digital output channels 00 and 01:

Channel No.	Configuration
DIOO	Counter
DI01	DI
D000	Pulse Output
D001	DO

In the third section of the configuration file, you obtain the Modbus address for each channel, under Modbus reference:

(2) Modbus addre	ss table		
Channel No. DI00	I/O type Input	Modbus reference 30001	Modbus address (Dec, Hex) 0000, 0x0000
DI01	Input	10002	0001, 0x0001
D000	Output	40001	0000, 0x0000
D001	Output	00002	0001, 0x0001

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1.3 The ioLogik E2210 supports Modbus function codes as defined by the Modbus protocol. Each data type has a specific address range. A quick overview of the address types and function codes can be found in the following table. For more detailed information on Modbus address mapping, please refer to the User's Manual.

I/O Type	Address	Data type	Common	Read/write	Function Codes
	range		name	behavior	
Event	30001 to	Read Only	analog inputs	16-bit quantity,	04=Read Input Register
Counter	39999	Registers		provided by an I/O	
				system, read-only	
Digital	10001 to	Read Only	binary inputs	single bit, provided	02=Read Discrete
Input	19999	Coils		by an I/O system,	Inputs
				read-only	
Pulse	40001 to	Read/Write	analog values,	16-bit quantity,	03=Read Holding
Output	49999	Registers	variables,	alterable by an	Registers
			registers	application	06 = Write Single
				program,	Register
				read-write	16 = Write Multiple
					Registers
Digital	00001 to	Read/Write	bits, binary	single bit, alterable	01=Read Coil
Output	09999	Coils	values, flags	by an application	05 = Write Single Coil
				program,	15 = Write Multiple Coils
				read-write	

In the previous example, the value of digital input channel 01 would be read by referencing Modbus address 10002 and function code 02. To read/write digital output channel 01, you would reference Modbus address 00002 and function codes 01 and 05. To read the value of the event counter at digital input channel 00, you would reference Modbus address 30001 and function code 04. To read/write the pulse output at digital output channel 00, you would reference 40001 and function codes 03 and 06.

- 2. Configuring KEPServerEX OPC Server (Kepware) with the ioLogik E2210
 - 2.1 Go to **Click to add a channel** in KEPServerEX OPC Server. Enter a channel name and click **Next**.



2.2 Under Device driver, select Modbus Ethernet and click Next.



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2.3 Select the correct network adapter for your host and click Next.



2.4 Go to **Click to add a device**. Enter a device name and click **Next**.

KEPServer	Ex - [untitled.op	[*]						
File Edit View	Users Tools He	lp						
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Click t	o add a device.	Tag Name New D	Address	Data Type A devic in lengt Names quotatic Device	Scan Rate	om 1 to 256 ch	aracters	
Date	Time	User Nar					L L	
1/27/2006	1:28:16 PM	Default L						
1/27/2006	1:28:16 PM	Default L						
1/27/2006	1:28:16 PM	Default L			1	Course 1	L max F	
1/27/2006	1:28:16 PM	Default L		K Back	Next >	Lancel	Help	
1/27/2006	1:28:16 PM	Default L						
1/27/2006	1:28:16 PM	Default User	KEPServerEx	Hilscher Univ	versal device driv	er loaded succe	essfully.	
1/27/2006	1:28:16 PM	Default User	KEPServerEx	Micro-DCI d	evice driver load	ed successfully.		
1/27/2006	1:28:16 PM	Default User	KEPServerEx	Modbus Plus	device driver lo	aded successful	lly.	
1/27/2006	1:28:16 PM	Default User	KEPServerEx	Modbus Uns	olicited Serial de	vice driver loade	ed successfully.	
1/27/2006	1:28:16 PM	Default User	KEPServerEx	ODBC Client	Driver device dr	iver loaded suc	cessfully.	

2.5 Under **Device model**, select **Modbus** and click **Next**.



2.6 Use the ioLogik E2210's IP address (default=192.168.127.254) and ID (default=0) in the **Device ID** field, then click **Next**.

KEPServerl	Ex - [untitled.op	f *] (Demo Expire	s 01:49:50)					
File Edit View	Users Tools He	lp						
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E Click t	o add a device.	Tag Name	Address	Data Type	Scan Rate	Scaling	Description	
			New Device		The device y part of a netw with the devic Your docume a "Network IE	ou are defining m vork of devices. I re, it must be assi ntation for the der " or "Network Ar	ay be multidropped as n order to communicate gned a unique ID. vice may refer to this as didress."	X
Date	Time	<			Device ID:	.254.0		
1 2/17/2006	11:35:11 AM	Default Liser	- Ui		1			
£ 2/17/2006	11:35:11 AM	Default User						
1 2/17/2006	11:35:11 AM	Default User						
0 2/17/2006	11:35:11 AM	Default User						
1 2/17/2006	11:35:11 AM	Default User						
1 2/17/2006	11:35:11 AM	Default User		<	Back Nex	t> Car	ncel Help	1
1 2/17/2006	11:35:11 AM	Default User						
12/17/2006	11:35:11 AM	Default User	KEPServerEx	Triconex Et	hernet device driv	er loaded succes	sfully.	
12/17/2006	11:35:11 AM	Default User	KEPServerEx	Uni-Telway	device driver load	led successfully.		
A 2/17/2006	11/35/11 AM	Default Licer	VFDSarvarF V	Heer Confid	urahle Driver dev	ice driver loaded	euccecefully	

2.7 Enter 502 for the **Port Number** and select TCP/IP for the **IP Protocol**, then click **Next**.



2.8 Go to **Click to add a static tag**. A dialog box will open up. The information you enter here will depend on the channel and mode that you are configuring.

KEPServer	x - [untitled.op	f *]	
File Edit View	Users Tools He	lp	
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MoxA	ei	Tag Name	Address Data Type Scan Rate Scaling Description add a static tag. Tags are not required, but are browsable by OPC clients. Image: Clients and Clients a
Data	Time		Data type: Default
1/27/2006 1/27/2006 1/27/2006 1/27/2006 1/27/2006 1/27/2006 1/27/2006	1:28:16 PM 1:28:16 PM 1:28:16 PM 1:28:16 PM 1:28:16 PM 1:28:16 PM 1:28:16 PM	Default User Default User Default User Default User Default User Default User Default User	Client access: Read/Write Scan rate: 100 milliseconds
1/27/2006 1/27/2006 1/27/2006	1:28:16 PM 1:28:16 PM 1:28:16 PM	Default User Default User Default User	OK Cancel Apply Help KEPServerEx Siemens 57 MP1 device driver loaded successfully.

DI tags should be assigned as follows: Address=the Modbus address of the desired I/O channel as found in the configuration file, Data type=Boolean, Client Access=Read only.



DO tags should be assigned as follows: Address= the Modbus address of the desired I/O channel as found in the configuration file, Data type=Boolean, Client Access=Read/Write.



Event Counter tags should be assigned as follows: Address= the Modbus address of the desired I/O channel as found in the configuration file, Data type=Word, Client Access =Read only.



Pulse Output tags should be assigned as follows: Address= the Modbus address of the desired I/O channel as found in the configuration file, Data type=Word, Client Access =Read/Write.

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E P MOXA			Tag Name	Address	Data Type	Scan Rate	Scaling	Description
E221	0			100002 000002 300001 400001	Boolean Boolean Word Word	100 100 100 100	None None None None	
		Ţ	ag Properties General Scaling Identification Name: Pulse-Output Address: 400001					
	and the second se	-	Description:					
Date	Time	User Name	- Data properties					
0 6/21/2006	3:17:15 PM	Default Us						
0 6/21/2006	3:17:15 PM	Default Us	Data type:	Word	-			
0 6/21/2006	3:17:15 PM	Default Us	CT I	[n. 11.15				
6/21/2006	3:17:15 PM	Default Us	Llient access:	Head/Write	-			
6/21/2006	3:17:16 PM	Derault Us	Scan rate:	100 -	milliseconds			
6/21/2006	3:17:16 PM	Default Us						
6/21/2006	3:17:16 PM	Default US						
6/21/2006	3:17:10 PM	Default Us						
6/21/2006	3:17:10 PM	Default Us						
6/21/2006	2:17:16 PM	Default Us		ОК	Cancel	Apple	Help	1
6/21/2006	3:17:16 PM	Default Us		L		- PP3	1	
6/21/2006	3:17:16 PM	Default Licer	KEPServerEx TIMA	V Host Adapter	device driver load	ed successfully		100

2.9 Next, click the Quick Client icon to monitor all of your configurations and values.

- KEPServerEx	- [untitled.opf *] (Den	no Expires 01:39	:47)				
<u>File Edit V</u> iew	v <u>U</u> sers <u>T</u> ools <u>H</u> e	lp					
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E MOXA		Tag Name	Address	Data Type	Scan Rate	Scaling	Description
E221	10 🤘	DI	100002	Boolean	100	None	
	(DO	000002	Boolean	100	None	
		Event-Cou	300001	Word	100	None	
		💋 Pulse-Output	400001	Word	100	None	
	1	4					
Date	Time	User Name	Source	e (Event		-
1 2006/6/19	03:35:19 下午	Default User	KEPS	erverEx	Siemens TCP/IP U	nsolicited Ether	met device driver loaded succe:
1 2006/6/19	03:35:19 下午	Default User	KEPS	erverEx	Siemens S7 MPI d	evice driver loa	ded successfully.
1 2006/6/19	03:35:19 下午	Default User	KEPS	erverEx	SIXNET UDR dev	vice driver loade	ed successfully.
-				200084 <u>=</u> 803		000020070002003	5 S 2 C 2 C 2 C 2 S S S S

The window will appear as below. You will be able to see the current status of the I/O channels that you configured.

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<u>File E</u> dit <u>V</u> iew	<u>T</u> ools <u>H</u> elp					
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= 📹 KEPware K	EPServerEx.V4	Item ID	Data Type	Value	Timestamp	Quality
📄 _Systen	n	MOXA.E2210.DI	Boolean	0	16:04:40:183	Good
- 💼 MOXA	_System	MOXA.E2210.DO	Boolean	0 0 0	16:04:32:442	Good
MOXA	.E2210	MOXA.E2210.Event-Counter	Word		16:04:35:386 16:04:27:264	Good
i 🛅 MOXA	.E2210System	MOXA.E2210.Pulse-Output	Word			Good
		۲.				
Date	Time	Event				
1 2006/6/19	03:43:39 下午	Asynchronous 2.0 transacti	on 001F15CF co	ompleted for	: 1 items on group ?	MOXA.E2
1 2006/6/19	03:43:53 下午	Asynchronous 2.0 write tra	nsaction 001F4F	32 initiated	for 1 items on grou	p MOXA
1 2006/6/19	03:43:53 下午	Asynchronous 2.0 write tra	nsaction 001F4F	32 complete	ed for 1 items on gr	oup MOX
🔒 2006/6/19	03-44-07 下午	Asynchronous 2.0 write tra	osaction 001 F83	BB initiated	for 1 items on one	IIII MOXA

2.10 To test DO or Pulse Output channels, right click the channel and select **Asynchronous 2.0 Write...**

► OPC Quick Clier File Edit Yiew □ 😂 🖬 💒	nt-未命名標題 * <u>T</u> ools <u>H</u> elp ☞ ♂ ☞ 』 ※ 『					
	EPServerEx.V4	Item ID	Data Type	Value	Timestamp	Quality
		MOXA E2210.DI	Boolean	0	16:04:40:183	Good
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VXOM 💼 🚽	.E2210	MOXA.E2210.Event-Counter	Word	0	New <u>I</u> tem	
MOXA.E2210System		MOXA.E2210.Pulse-Output	Word	0	Set <u>A</u> ctive Set <u>I</u> nactive	
					Synchronous (Synchronous) Synchronous)	Cache <u>R</u> ead Device Read Write
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 2006/6/19 2006/6/19 2006/6/19 2006/6/19 2006/6/19 2006/6/19 	03:43:39 下午 03:43:53 下午 03:43:53 下午 03:44:07 下午 03:44:07 下午	Asynchronous 2.0 transacti Asynchronous 2.0 write tra Asynchronous 2.0 write tra Asynchronous 2.0 write tra Asynchronous 2.0 write tra	on 001F15CF co nsaction 001F4F nsaction 001F4F nsaction 001F83 nsaction 001F83	ompleted tor 32 initiated f 32 complete BB initiated BB complete	Cu <u>t</u> Copy Paste Delete	Cttl+X Cttl+C Cttl+V Del
2006/6/19	03:44:07 下午	Failed on item MOXA.E22	10.Event-Count	er' for asyncl	Pr <u>o</u> perties	
2006/6/19	03:44:13 卜牛	Asynchronous 2.0 write tra	nsaction UUIF9A	EE initiated	tor 1 ttems on gro	up MOXA

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E : MEPware KEPServerEx.V4		Item ID		Data Type	Value	Timestamp	Quality	Update Cou
- System		MOXA.E2210.DI		Boolean	0	16:04:40:183	Good	3
MOXASystem		MOXA.E2210.DO		Boolean	0	16:04:32:442	Good	3
MOXA.E2210		MOXA.E2210.Event-Counter		Word	0	16:04:35:386	Good	2
MOXA.E2210System		MOXA E2210.Pulse-Output		Word	0	16:04:27:264	Good	3
	Asynchronous 2.0 V	/ /rite						×
	Item ID		Current Value	Winit	e Value			OK
	MOXA E22	10 DO		11	C TOLUC			Annly
Date 2006/6/19								Cancel
1 2006/6/19	04:04:35 下午	Ast	mchronous 2.0 read tran	isaction 0032437	2 initiated f	or 1 items on group	MOXA.E	
1 2006/6/19	04:04:35 下午	14:04:35 下午 Asynchronous 2.0 transaction 00324372 completed for 1 items on group MOXA E22				40XA.E22		
1 2006/6/19	04:04:40 下午	Asy	mchronous 2.0 read tran	isaction 003255F	3 initiated f	or 1 items on group	MOXA.E	
1 2006/6/19	04:04:40 下午	Asy	mchronous 2.0 transacti	on 003255F3 co:	mpleted for	1 items on group 1	40XA.E22	
Readyr								Item Count: 4

Modify the Write Value, then click **Apply** and **OK**.

When you return to the main screen, you should see the updated value.

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KEPware KEPServerEx.V4 System MOXASystem MOXA.E2210 MOXA.E2210System		Item ID	Data Type	Value	Timestamp	Quality				
		MOXA.E2210.DI	Boolean	0	16:04:40:183	Good				
		MOXA E2210.DO	Boolean	1	16:07:20:603	Good				
		MOXA.E2210.Event-Counter	Word	0	16:04:35:386	Good				
		MOXA.E2210.Pulse-Output	Word	0	16:04:27:264	Good				
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Date	Time	Event								
 ① 2006/6/19 ○ 03:43:53 下午 ① 2006/6/19 ○ 03:44:07 下午 ① 2006/6/19 ○ 03:44:07 下午 		Asynchronous 2.0 write transaction 001F4F32 completed for 1 items on group MOX								
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🙆 2006 <i>/</i> 6/19	03·44·07 下午	Failed on item MOXA E22	10 Event-Count	er' for assmo	hmmons 2 A write t	ransaction				