Краткое руководство по использованию KEPServerEX OPC Server (Kepware) совместно с ioLogik серии 4000 (модели NA-4010 и NA-4020/NA-4021)

1. Экспорт таблицы Modbus адресов из ioLogik 4000

1.1 Запустите программу ioAdmin. В левом меню нажмите правой кнопкой мыши на устройство NA 4000, таблицу Modbus-адресов которого нужно экспортировать. В появившемся меню выберите раздел **Export System Config** и сохраните конфигурационный файл (Puc.1):



Puc.1

1.2 Откройте сохраненный файл (Рис.2). В нем содержится информация о самом устройстве, установленных модулях (Таблица 1) и таблица Modbusадресов (Таблица 2):



📕 ik4000e.txt - N	otepad					
File Edit Format Vi	iew Help					
ioLogik 4000 N	etwork I/O Serv	er Configuratio	n			8
Date: Time: 10:03:41	ам					
1. Slice model	s					
slot No. 00 01 02 03 04	- Description NA-4010. ioLo M-4211, 2AO, M-3410, 4AI, M-1800, 8DI, M-2400, 4DO,	gik 4000 Etherr Voltage, -10~10 Voltage, 0~10V, sink, 24VDC, RT sink, MOSFET, 2	net network adapter VV, 12bit, RTB 12bit, RTB 14VDC, 0.5A, RTB			
2. slice confi	gurations					
00 NA-401 01 M-4211 01 M-4211 02 M-3810 03 M-1800 04 M-2400 04 M-2400	0 IP=192.168.12 watchdog=oisa ch01: Safe mo ch02: Safe mo -n/a- ch00: Safe mo ch01: Safe mo ch02: Safe mo ch03: Safe mo	.93,NM=255.255. ble de=Safe Value((de=Safe Value() de=Safe Status(de=Safe Status(de=Safe Status(de=Safe Status()	255.0,Gw=192.168.12.254,MA (x0000) (x0000) (oFF) (oFF) (oFF) (oFF) (oFF)	с=00-90-E8-0В-70-02		
3. Modbus addr	ess table					
STOT NO. 01 02 02 02 03 03 03 03 03 03 03 03 03 03 03 03 04 04 04 04 04 04 04 04	Channel No. 00 01 00 02 03 00 01 02 03 04 05 06 06 07 00 01 02 03 00 01 02 03 00 01 02 03 00 00 01 02 03 00 00 00 00 01 00 00	L/O type Output Input Input Input Input Input Input Input Input Input Input Input Input Output Output Output Output	Mndbus Address(WORD) 0x0800/0x00 0x0801/0x00 0x0001/0x00 0x0001/0x00 0x0002/0x00 0x0004/0x00 0x0004/0x01 0x0004/0x02 0x0004/0x02 0x0004/0x05 0x0004/0x05 0x0004/0x06 0x0004/0x06 0x0004/0x07 0x0802/0x01 0x0802/0x01 0x0802/0x02 0x0802/0x03	Modbus Address(BIT) 0x1000 0x1010 0x0000 0x0010 0x0020 0x0040 0x0041 0x0042 0x0043 0x0044 0x0045 0x0044 0x0045 0x0044 0x0045 0x0046 0x0047 0x1020 0x1021 0x1022 0x1023	<pre>I/O Data Length(bits) 0x0010 0x0010 0x0010 0x0010 0x0010 0x0010 0x0001 0x0001 0x0001 0x0001 0x0001 0x0001 0x0001 0x0001 0x0001 0x0001 0x0001 0x0001 0x0001 0x0001</pre>	
5						>

Puc.2

Таблица 1 «Описание модулей»

№ слота	Модель	Описание
00	NA-4010	ioLogik серии 4000, Ethernet-модуль
01	M-4211	2 AO, Voltage, -10 to 10V, 12-bit
02	M-3410	4 AI, Voltage, 0 to 10V, 12-bit
03	M-1800	8 DI, Sink, 24 VDC
04	M-2400	4 DO, Sink, MOSFET, 24 VDC, 0.5A

Таблица 2 «Таблица Modbus адресов»

No onoro	Ма канала		Modbus адрес	Modbus	I/О размер
JNº CHOTa	л⁰ канала	Тип І/О	(WORD)	адрес (BIT)	данных (бит)
01	00	Output	0x0800/0x00	0x1000	0x0010
01	01	Output	0x0801/0x00	0x1010	0x0010
02	00	Input	0x0000/0x00	0x0000	0x0010
02	01	Input	0x0001/0x00	0x0010	0x0010
02	02	Input	0x0002/0x00	0x0020	0x0010

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ИКА

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02	03	Input	0x0003/0x00	0x0030	0x0010
03	00	Input	0x0004/0x00	0x0040	0x0001
03	01	Input	0x0004/0x01	0x0041	0x0001
03	02	Input	0x0004/0x02	0x0042	0x0001
03	03	Input	0x0004/0x03	0x0043	0x0001
03	04	Input	0x0004/0x04	0x0044	0x0001
03	05	Input	0x0004/0x05	0x0045	0x0001
03	06	Input	0x0004/0x06	0x0046	0x0001
03	07	Input	0x0004/0x07	0x0047	0x0001
04	00	Output	0x0802/0x00	0x1020	0x0001
04	01	Output	0x0802/0x01	0x1021	0x0001
04	02	Output	0x0802/0x02	0x1022	0x0001
04	03	Output	0x0802/0x03	0x1023	0x0001

1.3 Мы можем одновременно собирать входную информацию с разных модулей (см. п. 1.2):

- Способ 1: используя модуль M4211 (2 аналоговых выхода). Modbus адрес (word) 0x0800=2048 (десятичное значение).
- Способ 2: используя модуль M3410 (4 аналоговых входа). Modbus адрес (word) 0x0000=0000 (десятичное значение).
- Способ 3: используя модуль M1800 (8 дискретных входов). Modbus адрес (bit) 0x0040=0064 (десятичное значение).
- Способ 4: используя модуль M2400 (4 дискретных выхода). Modbus адрес (bit) 0x1020=4128 (десятичное значение).

Для формирования запросов к разным модулям следует использовать различные адреса таблицы Modbus. Например, для запроса состояния канала DI 0 модуля M1800, следует использовать адрес 10065. Для получения значения аналогового входа AI 0 модуля M3410, следует формировать запрос на адрес 30001. Наиболее часто используемые блоки адресов представлены в Таблице 3.



Таблица	3
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Тип данных	Описание	Тип: чтение/запись	Формат адреса
Digital Outputs	Биты, двоичные	Один бит, чтение/запись	00001
	значения, флаги		09999
Digital Inputs	Двоичные входные	Один бит, только чтение	10001
	данные		19999
Analog Inputs	Аналоговые входные	16-битовое значение,	30001
	данные	только чтение	39999
Analog Outputs	Аналоговые значения,	16-битовое значение,	40001
	переменные, регистры	чтение/запись	49999

2. Настройка KEPServerEX OPC Server для обмена с NA-4010 используя Modbus-TCP

2.1 Запустите программу KEPServerEX OPC Server, добавьте новый канал выбрав в правом меню Click to add a channel, присвойте имя канала, и затем нажмите Next (Puc.3):

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Gick to a	dd a channel.	Tag Name	Address	Data Type	Scan Rate	Scaling	Description			
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				B	A channel i characters Names car quotations	name can be fro in length. I not contain per or start with an u	m 1 to 256 iods, double inderscore.			
					Channel na	me:				
					MOXA					
		<								
Date	Time	User Name								~
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1/27/2006	1:28:16 PM	Default User			-		1			
1/27/2006	1:28:16 PM	Default User			< Back	Next>	Cancel	Help		
1/27/2006	1:28:16 PM	Default User								
1/27/2006	1:28:16 PM	Default User	KEPServerEx	Fuji Hex d	evice driver loade	ed successfully.	8			
					Puc.3	3				

2.2 В новом окне выберите **Modbus Ethernet** в качестве протокола обмена с устройством, и нажмите **Next** (Puc.4):





2.3 Выберите требуемый сетевой адаптер и нажмите Next (см. Рис. 5):

	This channel is configured to com a network. You can select the ne that the driver should use from the Select 'Default' if you want the op to choose the network adapter for	municate over twork adapter list below. erating system you.
	Network Adapter:	
	Default	<u> </u>
	Default Intel(R) PRO/100 (192.168.12.	1211
	VMware Virtual Et., [192:168:188 VMware Virtual Et., [192:168:228	
2)	Lease cross and Long (200 and	<u></u>
	<back next=""></back>	Cancel Help

2.4 В появившемся окне добавьте новое устройство и укажите его имя (Puc.6):





Puc.6

2.5 Введите модель устройства (Modbus) (Рис.7):

The device you are defining uses a device driver that supports more than one model. The list below shows all supported models. Select a model that best describes the device you are defining.	
Device model: Modbus	
 < Back Next> Cancel I	Help

2.6 Определите IP-адрес устройства (NA-4010) и его ID. По умолчанию: IP 192.168.127.254 и ID 0. В новом окне нужно ввести ID устройства: запись должна выглядеть следующим образом: **192.168.127.254.0** (Рис.8). После ввода ID нажмите **Next**.





Puc.8

2.7 Установите порт Modbus TCP 502 и IP-протокол TCP/IP (Рис.9):

Specify the TCP/IP port this device will be using. Valid ports for this device are 0 to 65535. The default port is 502. The IP Protocol can be changed to UDP if your device supports it.
Port Number:
< Back Next > Cancel He

2.8 Нажмите на индикатор (см. Рис.10), чтобы добавить теги DI, DO, AI и АО к модулю.

2.9 Определите тег DI (Рис.11) и нажмите **Apply**, чтобы сохранить параметры каналов.

Параметры для DI: адрес 100065, тип данных – логический (Boolean), тип доступа – только для чтения (Read only).



Инструкция

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		General los et al	
		uerierai [scaing]	1
		Name: [U]	
		Address:	
		Description	
		Data properties	
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ate Time	User Name	Client access: Read/Write	
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2.10 Определите тег DO (Рис.12) и нажмите Apply.

Параметры для DO: адрес **0004129**, тип данных – логический (**Boolean**), тип доступа – чтение/запись (**Read/Write**).



Nar	ne: DO		8	
Addre	ss: 004129		2	/ 🛄 🦉
Descriptio	on:			<u> </u>
	inese II			
Data propert	ies			
	Data type:	Boolean	I	
	Client access:	Read/Write	•	
	Scan rate:	100 - mill	iseconds	
		1		

Puc.12

2.11 Определите тег AI (Рис.13) и нажмите **Apply**, чтобы сохранить параметры каналов.

Параметры для AI: адрес **30001**, тип данных – **Word**, тип доступа – только для чтения (**Read only**).

P	lame: Al	8	
Ad	dress: 300001	2	
Descri	ption:		
	1		
Data prop	erties		
	Data type:	Word	
	Client access:	Read Only	
	Scan rate:	100 🕂 milliseconds	
		Contraction Contra	

Puc.13

2.12 Определите тег АО (Рис.14) и нажмите Apply.

Параметры для АО: адрес **402049**, тип данных – **Word**, тип доступа – чтение/запись (**Read/Write**).



После завершения ввода данных об информационных каналах, нажмите **ОК**, чтобы закрыть окно Tag Properties.

N	lame: AO		8	
Add	tress: 402049		2	<u> </u>
Descrij	ption:			<u>X</u>
Data prop	erties Data type:	Word	1	
	Client access: Scan rate:	Read/Write	s	

Puc.14

2.13 Для просмотра описанных каналов и их значений нажмите на значок **Quick Client** (Puc.15):

KEPServerEx - [untitled.opf *]							×
File Edit View Users Tools Help	1						
	% 🖻 🖻 🗡	2 3 3					
E- MOXA	Tag Name	Address	Data Type	Scan Rate	Scaling	Description	- 27
Device1	AI	30 Quick Client	Word	100	None		
	(AO	402049	Word	100	None		
	DI	100065	Boolean	100	None		
	00 DO	004129	Boolean	100	None		

Puc.15

2.14 Выберите устройство и посмотрите параметры каналов DI, DO, AI и AO и их значения (Рис.16):

KEPware.KEPServerEx.V4 System Channel1. System MOXA.Device1	Item ID	Data Type	Value	Timestamp	Quality	Update Coun
	Channel1.Device1.AI	Word	0	13:41:35:522	Good	1
	Channel1.Device1.AO	Word	O	13:41:35:522	Good	1
	Channel1.Device1.DI	Boolean	O	13:45:32:142	Good	3
Channel1,Device1,_System	Channel1.Device1.DO	Boolean	0	13:45:32:092	Good	3
	-					1



2.15 Тестирование

Для установки значения каналов DO или AO, выберите требуемую запись и нажмите на ней правой кнопкой мыши, в появившемся меню выберите Asynchronous 2.0 Write и установите произвольное значение (Рис. 17-18):

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🖃 ز KEPware.KE	PServerEx.V4		Item ID	Data Type	Value	Tim	estamp	Quality	0
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MOXA.L	evice1System		MOXA.Device1.DO	Boolean	0	New Item		food	2
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1/27/2006	1:54:52 PM	Added 15 i	tems to group 'MOXA.Device1	System'.		Сору	Ctrl+C		
1/27/2006	1:54:52 PM	Added 4 ite	ems to group 'MOXA.Device1'.			Paste	i⊂trl+V		
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1/27/2006	1:55:14 PM	Asynchron	ous 2.0 write transaction 010E4	356 initiated for 1 item:	s on group 'MO;			-	
1/27/2006	1:56:43 PM	Asynchron	ous 2.0 write transaction 010F9	B6D completed for 1 ite	ems on group 'M	Properties	-00 -		
1/27/2006	1:56:43 PM	Asynchron	ous 2.0 write transaction 010F9	B6D initiated for 1 item	s on group 'MOX	A.Device1'.			~
Perform an asynchro	onous 2.0 write on the se	elected items						Item Co	unt: 41

Puc.17

tem ID	Current Value	Write Value	
Channel1.Device1.DO	0	1] Apply
			Cance

Puc.18

2.16 Установив значение, вернитесь в предыдущее окно, чтобы посмотреть измененное значение канала (Рис.19):



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KEPware.KEPServerEx.V4 System Channel1System MOXA.Device1	Item ID	Data Type	Value	Timestamp	Quality	Update Count
	Channel1.Device1.AI	Word	0	13:41:35:522	Good	1
	Channel1.Device1.AO	Word	o	13:41:35:522	Good	1
	Channel1.Device1.DI	Boolean	0	14:06:49:589	Good	7
Channel1.Device1System	Channel1.Device1.DO	Boolean	1	14:06:35:619	Good	

3. Настройка KEPServerEX OPC Server для обмена с NA-4020 и NA-4021, используя Modbus-RTU

3.1. Запустите программу KEPServerEX OPC Server, добавьте новый канал выбрав в правом меню **Click to add a channel**, присвойте имя канала, и затем нажмите Next (Puc.20):



3.2. В новом окне выберите **Modbus Serial** в качестве протокола обмена с устройством, и нажмите **Next** (Puc.21):





3.3. Далее следует установить параметры последовательного порта. По умолчанию: **ID** = COM5, **baud rate** = 9600, **Data bit** = 8, **Parity** = None. Скорректируйте параметры для взаимодействия с NA-4020/NA4021 (Puc.22):

	ID:	COM 5		
	Baud rate:	9600	_	
	Data bits:	8		
	Parity:	None	-	
1	Stop bits:	• 1	C 2	
	Flow control:	None	•	
	Use modem	🔽 Be	port comm. error	•
	Use Ethernet	encapsulation	1	
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3.4. Добавьте новое устройство и укажите его имя (Рис.23):



Puc.23

3.5. Выберите ID устройства. Оно соответствует ID NA-1020/NA-4021 (Рис.24):



3.6. Повторите шаги 2.8-2.16 для конфигурации тегов для каналов DI, DO, AI и AO.

