PLC with EPSNET support have several memory areas available for data writing and reading. These areas can contain any information. That is why the instructions contain several particular examples for controlling variables of memory registers. Controlling variables of any type can be performed by the principles described in the examples below.

Contents

- 1 Rules of Addressing for EPSNET Registers in iRidium
- <u>2 Controlling Boolean Values</u>
 - 2.1 Setting up Values by Button
 - 2.2 Trigger Switching
- <u>3 Controlling the Range</u>
 - <u>3.1 Dimming by Level</u>
 - <u>3.2 Increment/Decrement</u>
 - 3.3 Trigger Switching
 - <u>3.4 Setting up Values by Button</u>
- <u>4 Displaying the Status</u>

Rules of Addressing for EPSNET Registers in iRidium

Export the controller configuration in the SCADA format to **get the list of addresses and bits** in the addresses you need to add in iRidium for controlling one or another controller input/output.

Export of addresses is available in Mosaic (TECO) and IDM (iNELS).

Setting up export in Mosaic:



Important: if you already generated the *.pub file (compiled the project), before doing it again delete the previous *.pub file, otherwise addresses in the project will be duplicated.

Setting up export in IDM iNELS:

Convention type C Net connect	Pachees PRI-346.1.12				
Convertis OFU Converts SofPic	Connection text				
ngunga nglai-(), Marci States)	Convertitions				

A Make sure the IDM program is connected to the controller. Otherwise the export is not possible.

Select variables for export in the managing program of the device: "Unit/Device Manager". Do not forget to indicate the NAMES of the exported variables:

Proje	ct 29,07 2	2010-0	8-30 15-18-43		
Project	Setup	Help	RUN	M D 🙆 🛛 🔍 🔊 🛛	o 🔨 🖸 💱
				13	
/device	manager				
		MIO	MT2	1	
•	1		Muz		
B1	CIB2				
D	H₩ ad	ID	Unit/device type	St Name of Unit/device/I/O	Setup
			IR reader	Infra device	Select unit/device
			Voice input	Voice device	
4	392E	1	DAC2-04M	DAC2-04M	Input / Output caption
			Analog output	triak outputs	OUT4
				OUT1	
				OUT2	Unit HW address 3881
				OUT3	
٠. -	orne		540 00M/F-	OUT4	
3	2000	1	Digital output	SA2-02M/Sh	Use device
			Digital output	RF1	
				RE2	SCADA SW
6	3504	1	SA2-04M/Sn	5A2-04M/5n	I✓ Export
			Digital output	universal rele outputs	Name (alias
				RE1	Out 4
				RE2	loor".
				RE3	
				RE4	
7	2E34	1	SA2-02B/Sn	5A2-02B/5n	
			Digital output	universal rele outputs	
· · · · ·					
Show	units, devic	es			
Show	units, devic	es, I/O			Exchange Units
	Add unit		Delete unit	Delete all	Read configuration from controller
				🗸 ок	X Cancel 💡 Help

Open "Project Setup" and indicate the path for saving the export file. The tab can be called '...Of SCADA' or 'RELI':

Common settings	×
Project setup	
Project	I✓ Make export for scada sw
Version number	C:\Project.pub
General information	Export only selected IO
Vendor Information	Extended export binary inputs
WWW links	Announcement of change in export files
Setup export	
of SCADA	Export map of event's
of Web page	
of Text file	
of OpenOffice sheet	
	✓ OK X Cancel

For the ***.pub** file to be exported on PC you need to upload the configuration on the controller:



You can open the *.pub file in the text editor. It contains the list of addresses in the iRidium supported format. For example:

Чемодан 2014-10-00 10-25-49 - Сору Проект Установка Поноца — НоСолия — М D 🖗 🥔 🕾 🛠 🎉 🕅 🧑 🔳	0 = 4		
		A Nuf	- 0 2
Менеджер мадуля/устройства НТ мар мар		»	plant
CBB CB2 D HW apper ID Ten waa yna/yrtpolkma C Hassewe Magyra/Yrtpol, * Sophy DVM Sophy UP Sophy IV 3 Sophy IV 4 IV 5 IV 6 Taproganies: fearno amsor Carnessoure yrtpolk Jaffa device Pronceschi saa Visco device and a strict a back-beam - back-beam	Установка Выбар надуля Влад. Накад заголовог [ОШТ3 Адрес аппаратных сред 339°С р7: Напосызовать устройство SCADA 500 р7: Эконорт	ChilderkiefSNET/demo.pub. Notepad Deino Tipassa Tonox Brg Kapposen Contacted Organ Contacted Statematic December C	Marpoca Janyce Rearma Oosa ? * *
0//3 0//3 0//3 0//3 0//4 5 2ECA 1 SA2-02Pt/Sn - SA2-02Pt/Sn Urdpoto/iteurea_ unvertail rele outputs REI + + + + + + + + + + + + + + + + + + +	Haasave / alaa DuC2_044_00T3	74 state 30PHY2 RE1 Y B 5 .0 BOCL PUB 75 state 30PHY2 RE2 Y B 5 .1 BOOL PUB 76 soPHY2 TERM x F 11 REAL PUB INOUT 77 state DAC2 04M OUT1 Y F13 REAL PU 73 DAC2 04M OUT1 SF 18273 [] SOCL 74 DAC2 04M OUT1 F 18276 REAL PUB I 81 state DAC2 04M OUT2 Y F 15 REAL PUB 81 state DAC2 04M OUT2 Y F 15 REAL PUB 81 state DAC2 04M OUT2 Y F 15 REAL PUB I	OUT OUT B_OUT B_OUT B_DINOUT L_PUS_INOUT NOUT B_OUT
р таказать недули, устроиства Показать недули, устройства, 1/0 Добевить недуль. Уделить недуль. Уделить все	Обленные кодути Прочетать конфигурацию от СЦ	82 DAC2_04M_OUT2_ON R B 18320 .1 BOOL 83 DAC2_04M_OUT2_OFF R B 18320 .2 BOO 84 DAC2_04M_OUT2_OFF R B 18359 REAL PUB I 4 m m m	PUB_INCUT L PUB_INCUT NCUT
Z4		action address bit o	of address

Address parameters:

state_DAC2_04M_OUT1 Y F 11 REAL PUB_OUT
DAC2_04M_OUT1_ON R B 18237 .1 BOOL PUB_INOUT

DAC2_04M_OUT1_OFF R B 18237 .2 BOOL PUB_INOUT DAC2_04M_OUT1 R F 18276 REAL PUB_INOUT

state_DAC2_04M_OUT1 Y F 11 REAL PUB_OUT

• **state_NAME** – the address for reading the register state

- Y the register type (Register: Y)
- F the register size (Type: Float...)
- 11 the register address (Address: 11)
- _OUT = Read Only

DAC2_04M_OUT1_ON R B 18237 .1 BOOL PUB_INOUT

• NAME_ON - the address for channel activation (ON only)

- R the register type (Register: R)
- B the register size (Type: Bool)
- 18237 the register address (Address: 18237)
- .1 the bit address in the address (Bit: 1)
- _INOUT = Read/Write

Usually bits are presented as follows: 0 = ON, 1 = OFF, 2 = TRIG

```
DAC2_04M_OUT1 R F 18276 REAL PUB_INOUT
```

- NAME the address for dimming (controlling the range)
 - R the register type (Register: R)
 - F the register size (Type: Float...)
 - 18276 the register address (Address: 18276)
 - _INOUT = Read/Write

<u>↑ Back</u>

Controlling Boolean Values

To control logic variables (in particular, for switching separate bits) it is necessary to create commands (Command) and feedback channels (Feedback) in the project device tree in iRidium. Commands are required for sending data, feedback channels are required for reading the current variable status.

For registers available for reading only it is possible to display the current state.

Setting up commands in iRidium GUI Editor:

To control boolean variables (taking values 0 or 1) create a command for setting up the state and a feedback channel for displaying its actual status:



Properties for setting up:

Name: the register name, at random

Type: the variable size

Register: variable

Address: the byte address

Bit: the bit number in the byte (0..7)

When the command and feedback channel are ready (they form the pair which helps to control the register state) you should set up graphic items. Switching 2 possible states (0/1) of the boolean variable is possible with the help of the following graphic items:

- **Button** when assigning the command to Button indicate the number which should be sent to the variable at each pressing. This value cannot be changed when working with the project.
- **Trigger Button** is used for switching two preset values, for example 100% and 0% of brightness. The values are indicated when setting up the graphic item. Trigger Button defines the value for sending at the next pressing depending on the current value received with the help of the feedback channel.

Setting up Values by Button

Create and set up the graphic item - Button – for sending 0 or 1 value to the variable. Assign the command to Button following the steps below:

			50 100	150 200	250	300							
PROJECTS OVERVIEW	1:	0				•	PROJ	ECT	DEVIC	E PA	NEL		
🖹 🖱 🖿 🔍 🗎 🔅	1 🦉 🕂 🖑						+ -	🗗	b 🙁	t	÷	•	• 👱 🍣
- Project 1		50			- 3		€ ~ ▶	> Sy	ystem T	oken	s		
								Pr	roject T	oken	s		
E Page 1							- 1	r Dr	rivers				
		100		Send String				•	EPSN	ET (L	IDP)		
OBJECT PROPERTIES				Send Number				÷	Drive	r Tok	ens		
General Progra	mmina States			Send Token				E.	Comr	nand	5		`
News	Them 0	150_		Send Binary Dat					<u> </u>	Ch	annel 1		·)
Name Left	22	-	- T -	,,					Feed	back			~
Top	52 69			6.10	- 1	_		_					
width	82	200		Send Comma	and								
Height	84	1 1											
Active	True			Action:	Send Number								
Visible	True	101		Event for A	ction								
Specific		<u> </u>	4	Press	1							Value	
Туре	Button										=		
Feedback	Momentary	300		Release	0						'	Value	
Hit	Active Touch			Hold	0							Value	
Password Number	None				Ľ								
Default Value	0	350		Move Move								Value	
Hold Time	500												
Repeat Time	250												
		400		Add a fe	eedback channel								
				Feedback:	In Value				•				

1. Setting up of the register variable is performed according to the first section of the instructions.

2. Setting up of the graphic item is performed in the **Object Properties: General** tab. Select **Type: Button** and set up the item:

Feedback - the way of reacting on events:

Momentary – for Button which goes to the active state at pressing on it and returns to the initial state at releasing it *Channel* – for Button which should receive feedback from the variable and go the active state when receiving value 1 from it.

Other properties should be set if it is required.

3. Assigning of the command to the graphic item should be made with the **"Send Number"** tag in the dialog window - the number which you will indicate in the dialog window will be sent.

4. Selecting of the event and value for sending is done depending on the required behavior of the item. If Button should send a number at pressing on it select the Press event and the required number. If Button should switch the variable only at pressing indicate Press: 1, Release: 0.

You can activate "Add a Feedback Channel" to assign the feedback channel with the same name as command automatically. If you want to assign the feedback channel later use the "In Value" tag to affect the item state.

Trigger Switching

<u>Trigger Button</u> is used for switching two selected values of the variable. They are 0 and 1 for logic variables. Set up Trigger Button and assign the register to it following the steps below:



1. Setting up of the register is performed according to the first section of the instructions. For Trigger Button it is required to have the command and feedback channel. Trigger Button will not work correctly without the feedback channel.

2. Setting up of the graphic item is performed in the **Object Properties: General** tab. Select **Type: Trigger Button** and set up the item:

Feedback - the way of reacting on events:

Channel - the item should process data received from the equipment and display them.

Trigger Value 1 and **Trigger Value 2** – values the item switches at each pressing (0/1). Every time the item selects the value opposite to the current one for sending. The feedback channel is used for receiving the current value. Other properties should be set if it is required.

3. Assigning of the command to the graphic item should be made with the **"Send Token"** tag in the dialog window - the item will send the value opposite to the current Value at pressing.

4. Selecting the event of command sending - Press or Release.

5. Activating of "Add a Feedback Channel" is required to assign the feedback channel with the

same name as command automatically. It fastens work with the device tree. If you want to assign the feedback channel later use the "In Value" tag to affect the item state.

Controlling the Range

The dimming function is typical for controlling light, temperature, etc. It can be used for controlling signed and unsigned variables, numbers with floating point. You can set up dimming of any controller variable in iRidium. In order to do that you need to create a command (Command) and a feedback channel (Feedback) in the project device tree. Commands are required for sending data; feedback channels are required for reading the current variable status.

For variables available for reading only dimming is impossible but it is possible to display the current state on a slider or screen.

Setting up commands in iRidium GUI Editor:

For the variable which change in the preset range (for example it can be a dimmer for light) create a command for setting up the state and a feedback channel for displaying its actual status:



Properties for setting up:

Name: the register name, at random

Type: the variable size

Register: variable

When the command and feedback channel are ready (they form the pair which helps to control the register state) you should set up graphic items. Dimming, increment/decrement and switching of the register states can be done with the help of the following graphic items:

- Level is used for regulating the value in the preset range by moving the Level slider. It can be used for controlling the variable or for displaying its status.
- **Trigger Button** is used for switching two preset values, for example 100% and 0% of brightness. The values are indicated when setting up the graphic item. Trigger Button defines the value for sending at the next pressing depending on the current value received with the help of the feedback channel.
- **Up/Down Button** is used for incrementing/decrementing the current variable value received from the feedback channel.

Dimming by Level

Create and set up the graphic item - Level – for controlling the controller variable. Assign the command to the item following the steps below:



1. Setting up of the variable is performed according to the first section of the instructions. For dimming it is required to have the command and feedback channel. Level will not display the actual state without the feedback channel.

2. Setting up of the graphic item is performed in the **Object Properties: General** tab. Select **Type: Level** and set up the item:

Feedback - the way of reacting on events:

Channel – for Level which will monitor the actual variable status *Momentary* - for Level which will NOT display the actual variable status

Min: 0 - the lowest value of the Level scale Max: 100 - the highest value of the Level scale

The Min...Max range defines the limits of regulation. By reducing the limits you can create a cutoff (the regulation range which is less than the available one).

Direction: Vertical/Horizontal – the item position

Other properties should be set if it is required.

3. Assigning of the command to the graphic item should be made with the **"Send Token"** tag in the dialog window - the item will send the value selected at the moment by the slider (Token: Value of the graphic item).

4. Selecting the event of command sending can be done at random, but it is better to use the combination of Press and Release (the first is sent when touching Level, the second – when releasing it). The Move event will send values with the moving slider; but it can overload the controller (use with caution).

5. Activating of "Add a Feedback Channel" is required to assign the feedback channel with the same name as command automatically. If you want to assign the feedback channel later use the "In Value" tag to affect the position of the Level slider.

Increment/Decrement

It is convenient to use Up/Down Buttons for accurate regulation (for example, +\- 1°C). Set them up in the iRidium project:

OBJECT PROPERTIES		0	50 100	OBJECT PROPE	ERTIES			<mark>))</mark>	450	500
General Progra	mming States	0_		General	General Programming States					
Name	Item 9			Name		Item 8				
Left	142	50		Left		142				
Тор	234			Тор		83				
Width	72			Width		72				
Height	66	100		Height		66				
Active	True			Active		True				
Visible	True			Visible		True				
Specific		150		Specific						
Туре	Up/Down Button	150		Туре		Up/Down Button				
Feedback	Momentary			Feedback		Momentary	/			
Hit	Active Touch			Hit		Active Touch				
Up/Down Value	-10	200_		Up/Down Value		10				
Max/Min Value	0			Max/Min Value 100						

Indicate the following in the settings of <u>Up/Down Buttons</u>:

Feedback - the way of reacting on events:

Momentary - the item should react on pressings (this feedback type is recommended)

 $Up/Down \ Value$ – the step of increment/decrement at each pressing ("-10" / "10" – decrement or increment)

Min/Max Value – limits which cannot be exceeded. For decrementing indicate the lowest regulation value, for incrementing – the highest (for example, "0" for the decrementing step "-10", and "100" for incrementing step "10").

Assignment of the command and feedback channel is performed as for Level. The items will not work correctly without the feedback channel.



1. Assigning of the command to the graphic item should be made with the **"Send Token"** tag in the dialog window - the item will send the value which is lower or higher than the current one.

2. Selecting the event of command sending - Press or Release.

3. Activating of "Add a Feedback Channel" is required to assign the feedback channel with the same name as command automatically. If you want to assign the feedback channel later use the "In Value" tag to affect the current item state.

Trigger Switching

<u>Trigger Button</u> is used for switching two selected values of the variable. Set up Trigger Button and assign the register to it following the steps below:



1. Setting up of the register is performed according to the first section of the instructions. For Trigger Button it is required to have the command and feedback channel. Trigger Button will not work correctly without the feedback channel.

2. Setting up of the graphic item is performed in the **Object Properties: General** tab. Select **Type: Trigger Button** and set up the item:

Feedback - the way of reacting on events:

Channel - the item should take the state corresponding to the current variable value.

Trigger Value 1 and **Trigger Value 2** – values the item switches at each pressing. Every time the item selects the value opposite to the current one for sending. The feedback channel is used for receiving the current value.

Other properties should be set if it is required.

3. Assigning of the command to the graphic item should be made with the **"Send Token"** tag in the dialog window - the item will send the value opposite to the current Value at pressing.

4. Selecting the event of command sending - Press or Release.

5. Activating of "Add a Feedback Channel" is required to assign the feedback channel with the same name as command automatically. It fastens work with the device tree. If you want to assign the feedback channel later use the "In Value" tag to affect the item state.

Setting up Values by Button

Create and set up the graphic item - Button – for sending a number to the variable. The number should be in the available range of the selected variable (it depends on the variable size). Assign the command to Button following the steps below:



1. Setting up of the register variable is performed according to the first section of the instructions.

2. Setting up of the graphic item is performed in the **Object Properties: General** tab. Select **Type: Button** and set up the item:

Feedback - the way of reacting on events:

Momentary – for Button which goes to the active state at pressing on it and returns to the initial state at releasing it

Channel – for Button which should receive feedback from the variable and go the active state when receiving value 1 from it.

Other properties should be set if it is required.

3. Assigning of the command to the graphic item should be made with the **"Send Number"** tag in the dialog window - the number which you will indicate in the dialog window will be sent.

4. Selecting of the event and value for sending is done depending on the required behavior of the item. If Button should send a number at pressing on it select the Press event and the required number. If Button should switch the variable only at pressing indicate Press: 1, Release: 0.

You can activate "Add a Feedback Channel" to assign the feedback channel with the same

name as command automatically. If you want to assign the feedback channel later use the "In Value" tag to affect the item state.

Displaying the Status

The current state of the controller variable can be displayed on the selected item of the graphic interface. It is convenient to use Buttons, Levels, Display Buttons (Buttons with 1 state).



The feedback channel can be assigned to the graphic item with the "In Text" or "In Value" tag depending on what graphic item property the value from the channel will affect:

- **In Value** the value received from the feedback channel. It will change the graphic item state switching it from the non-active to active or moving the Level slider. «Templates of value output on items» (see below) are also used at work.
- **In Text** the value received from the feedback channel will substitute any text which was written in the graphic item text field by default.
- **More...** here you can select any graphic item property the value from the channel should affect, for example, opacity, activity or X and Y coordinates.

Templates of processing and outputting data for feedback channels:

Template	Function	Template	Function
\$P	Output of the current level value in percentage	\$V	Output of the current value
\$L	Output of the lower level value	\$H	Output of the upper level value
\$S	Output of the current state number	\$A	Output of the current value minus the lower level value
\$R	Output of the level range (Upper level value minus lower level value)	\$F1-5	Output of the value with a floating point, number of symbols after a point
\$X	Output of the current value in the hex type	\$\$	Output of the "dollar" symbol

A command (template) of incoming data processing and displaying is entered into the text field of a graphic item and can be combined with other text or symbols (comments, units of measurement)

• Download: Project with templates of value output on items (0.7 Mb)