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Application example • 12/2016

SIMATIC IOT2000 S7-Communication

SIMATIC IOT2020, SIMATIC IOT2040

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1 Task

1.1 Overview

Introduction

This application example shows how to read out a variable from a Siemens S7-1500 PLC via S7 communication. As PLC a SIMATIC S7-1500 Software Controller V2.0 is used.

Goals

After working through this document you will know how to

- Use the node-red node for S7 communication
  - read a value
- Store the data in a file on the IOT2000

NOTICE	**Precondition!** To use this sample it is required that the Initial Operation in the Document “Setting up the SIMATIC IOT2000” has been executed once.

2 Application Example

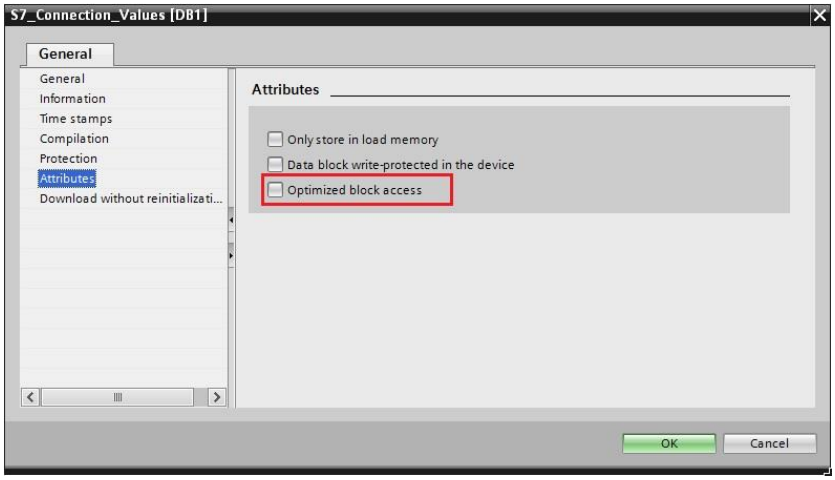
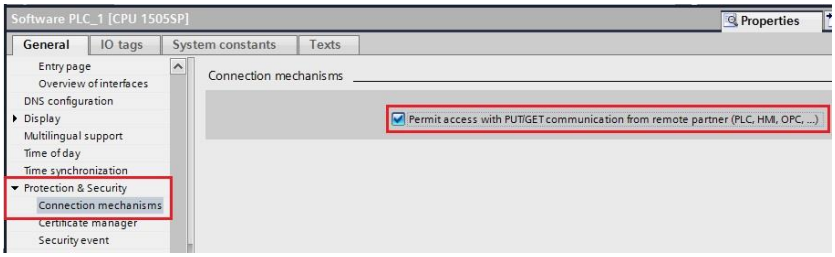
This chapter describes how an application can be created with node-red.

This application contains a node-red S7 communication node reading two values from a data block of the SIMATIC S7-1500 Software Controller. The values are saved in a file on the IOT2000.

2.1 Preconditions for S7 communication

These are preconditions regarding settings which have to be done in TIA-Portal.

Table 2-1

No.	Action
1.	You can only use non-optimized data blocks. This feature can be set in the properties of the data block. Make sure the box is unchecked. 
2.	You have to enable PUT/GET communication in the device configuration of the S7-1500 PLC. Make sure the box is checked 

NOTE Doing No. 2 opens up the controller for other access by other applications as well, so be aware of the security implications of doing this.

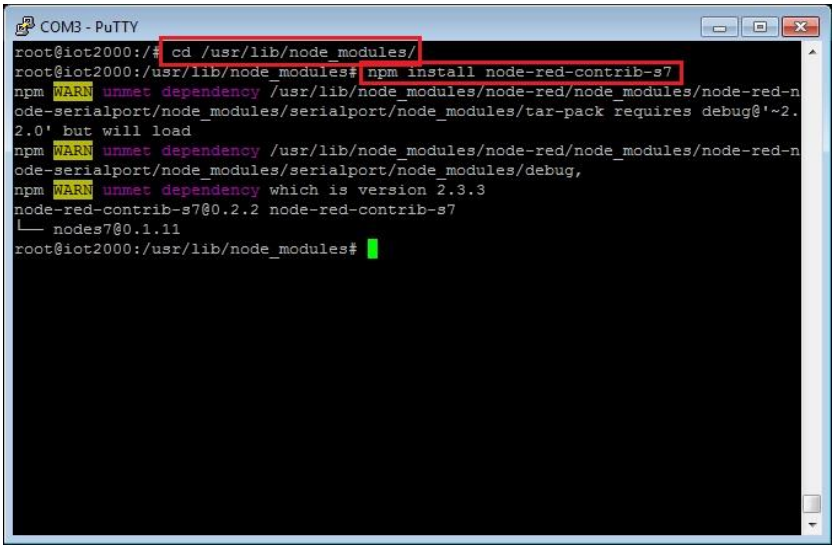
2.2 Install node-red S7 node

From version V2.1.2 of the example image the program node-red is preinstalled.
The additional node for S7 communication has to be installed by the user.

NOTE For installing an internet connection is required!

The following table shows how to install the additional node.

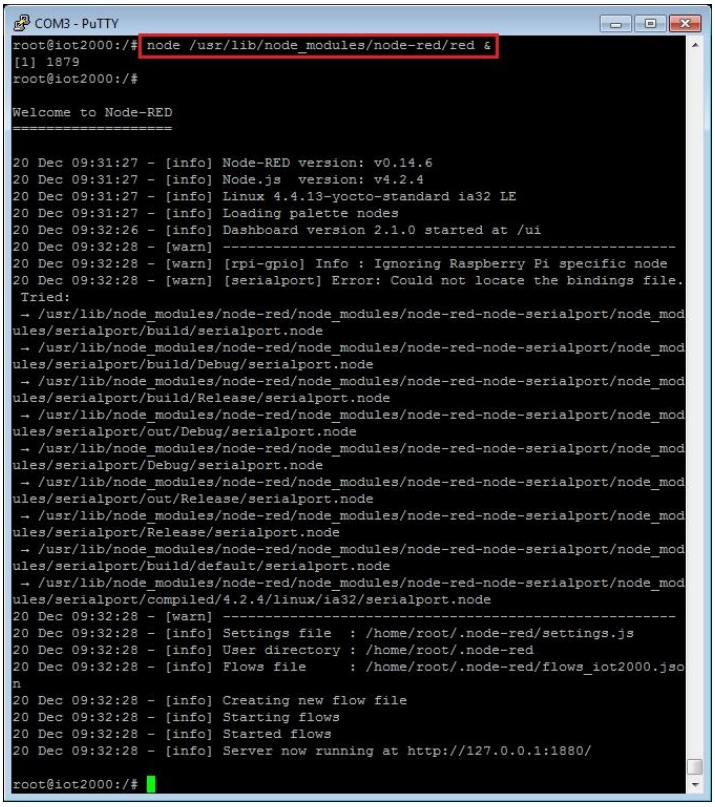
Table 2-2

No.	Action
3.	Open a valid Putty Connection to your IOT2000
4.	Type in **cd /usr/lib/node_modules** to go to the node-red directory
5.	Type in **npm install node-red-contrib-s7** to install the node 

2.3 Start node-red

The following table shows how to start node-red.

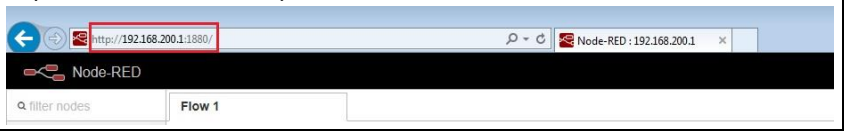
Table 2-3

No.	Action
1.	Type in **node /usr/lib/node_modules/node-red/red &** to start node-red 

2.4 Open node-red Web interface

The following table shows how to open the Web interface of node-red.

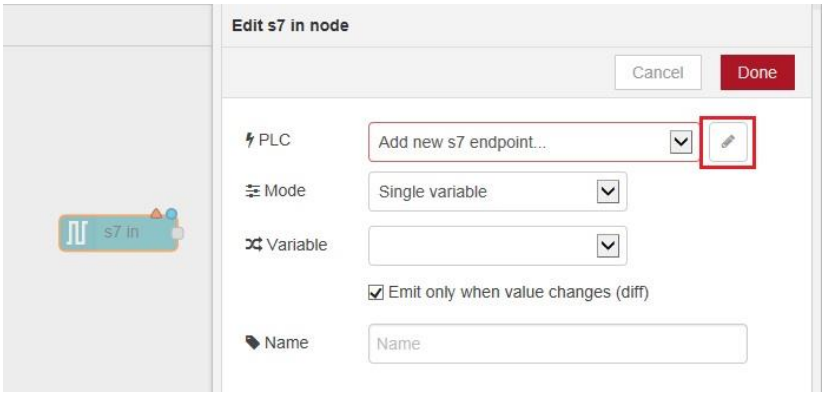
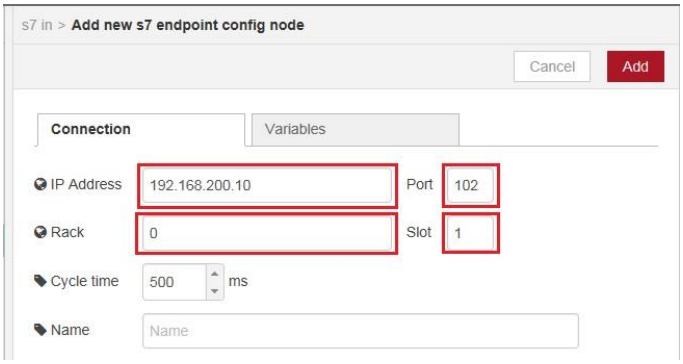
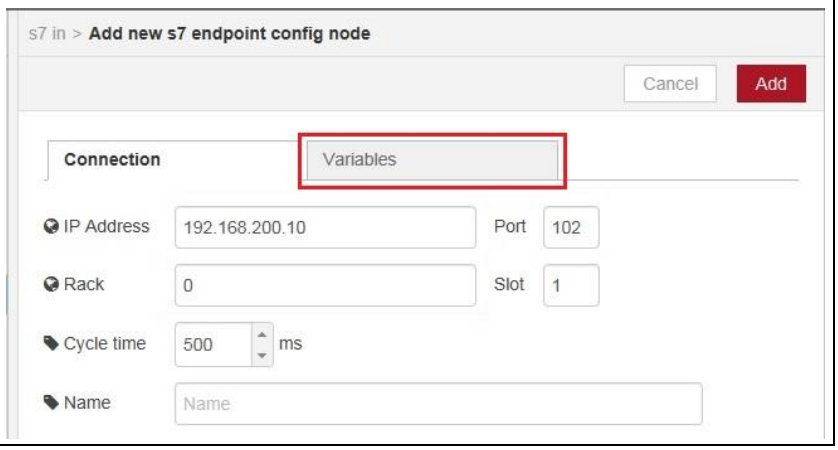
Table 2-4

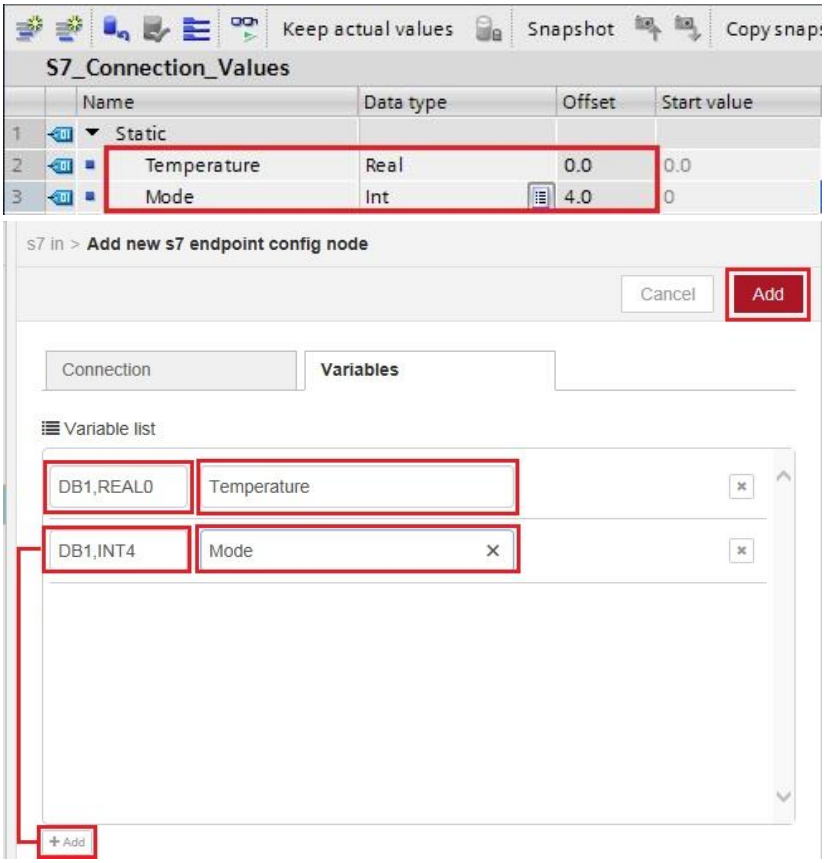
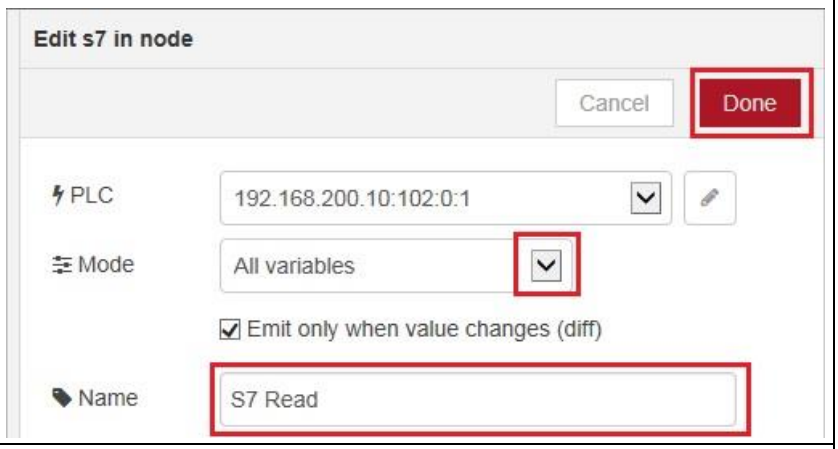
No.	Action
1.	Add the IP-Address of the IOT2000 and the port 1880 to a browser (i.e http://192.168.200.1:1880) 

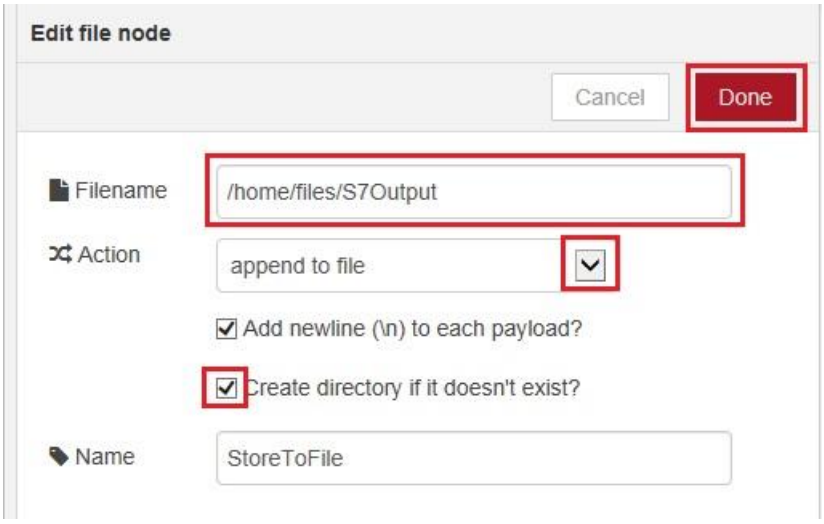
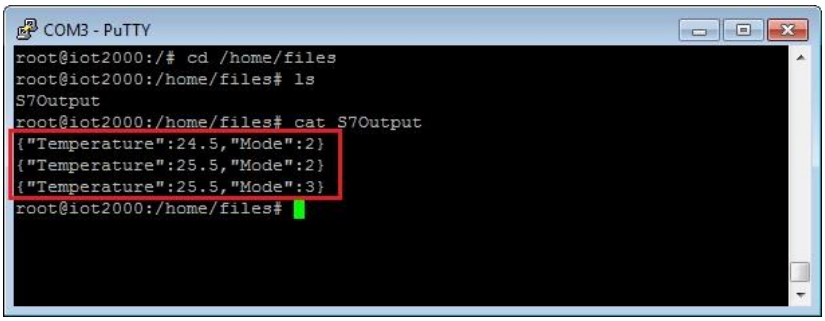
2.5 Configure node-red program

Configure S7 node

Table 2-5

No.	Action
1.	Choose “s7 in” on the left hand side and add it per Drag&Drop to the middle
2.	Double-click on the node 
3.	Add a new Endpoint with IP address, Port, Rack- and Slot number of the S7-PLC and a reading cycle time. You can find this information in the “Device Configuration” of the S7-PLC in the TIA-Portal. 
4.	Click on the tab “Variables” 

No.	Action
5.	Add the variables you want to read out and give them a name. The address is “DB,DatatypeOffset”. You can get this information from the TIA Portal.  Click Add
6.	Choose a Mode and give the node an optional name Click Done 
7.	Scroll the left bar to “storage” and choose the output node “file” add it per Drag&Drop to the middle
8.	Double-click on the node

No.	Action
9.	Configure Filename, Action and an optional name Click Done 
10.	Wire the nodes and click on deploy 
11.	Every time a value changes, both values will be appended to the file on the IOT2000 

3 Checklist

This chapter contains a Checklist which summarizes all important steps in this application example.

Table 3-1

No.	Action
1.	Make sure preconditions in TIA Portal are given
2.	Install S7 node
3.	Start node-red
4.	Open node-red Web interface
5.	Configure S7 node and deploy
6.	Check file on IOT2000

4 Related links

Table 4-1

	Topic
\1\	SIMATIC IOT2000 forum www.siemens.com/iot2000-forum
\2\	SIMATIC IOT2000 Setting Up https://support.industry.siemens.com/tf/ww/en/posts/155642/
\3\	SIMATIC IOT2000 Getting Started https://support.industry.siemens.com/tf/ww/en/posts/155643/
\4\	Description of the nodeS7 https://github.com/plcpeople/nodeS7

5 History

Table 5-1

Version	Date	Modifications
V1.0	12/2016	First version