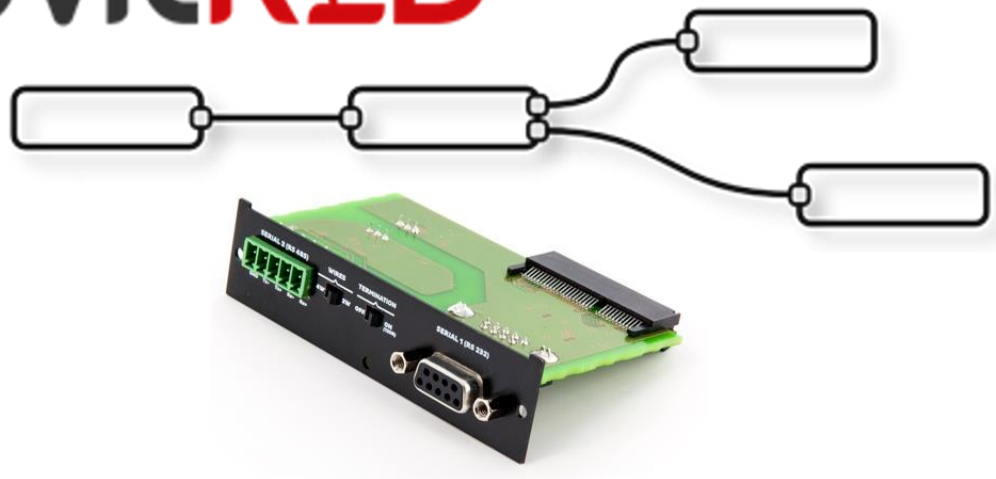


LuvitRED



Infinite serial cable using the industrial serial card

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1 Introduction

This document covers the configuration of the industrial serial card using LuvitRED for an infinite serial cable application:



Figure 1: Infinite serial cable application.

The industrial serial card (CG1102-11920) is shown on Figure 2 below:



Figure 2: Industrial Serial Card

- The **RS232** interface is shown on the operating system of the CloudGate as **/dev/ttySP0**
- The **RS485** interface is shown on the operating system of the CloudGate as **/dev/ttySP4**
- The **RS485** interface also has two switchable items that need to be set correctly on the plate:
 - The first item is the amount of wires to use: 4W or 2W.
 - The second item is the termination: OFF or ON.

NOTE: The RS232 serial interface on both serial expansion boards (CG1102-11920 and CG1101-11919) is a **DCE** interface. For this reason, the cable that is being used to connect the CloudGate with the remote asset should be appropriate for a **DCE-DCE** (Crossover/Null modem) or **DCE-DTE** (straight-through) communication.

2 Basic interface - Configuring the RS232 interface.

This section is applicable to both the industrial serial card (CG1102-11920) and the Standard/Low cost serial card (CG1101-11919).

Go to the "Plugin" tab, under it one will find a sub-tab called "Serial and GPS settings" or "LuvitRED" (The name depends on the LuvitRED version being used):

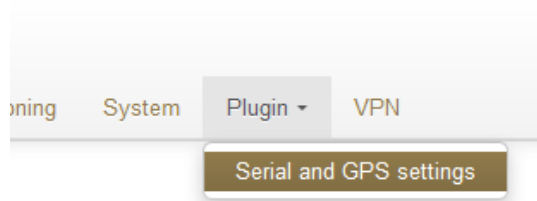


Figure 3: Plugin tab, Serial and GPS settings.

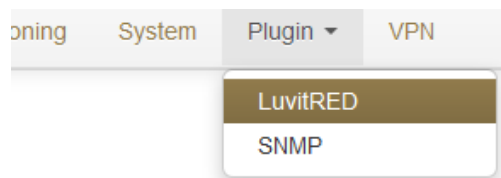


Figure 4: Plugin tab, LuvitRED.

Without any configuration, the basic interface looks as follows:

 A screenshot of a configuration page titled 'Serial port to TCP local or remote server'. It contains two sections. The first section has an 'Enable' label followed by two radio buttons: 'yes' (selected) and 'no'. The second section is titled 'GPS to TCP local or TCP/UDP remote server' and also has an 'Enable' label with 'yes' (selected) and 'no' radio buttons. At the bottom left are 'Save' and 'Reset' buttons. At the bottom right is an 'Advanced Editor' button.

Figure 5: Basic interface.

We are going to focus on the section called "Serial port to TCP local or remote server". This section allows the configuration of one single serial port, the RS232 (`/dev/ttySP0` by default), to be accessible remotely via a local TCP server running on the CloudGate (See Figure 6) or a remote TCP server, running at another location (See Figure 7).

Serial port to TCP local or remote server

Enable

yesno

Serial port settings

Baud rate9600

Data bits

7

8

Stop bits

1

2

Parity

none

even

odd

mark

space

Flow control

none

XON/XOFF

CTS/RTS

TCP settings

TCP server isLocalRemote

Port8889

GPS to TCP local or TCP/UDP remote server

Enable

yesno

Save

Reset

Advanced Editor

Figure 6: Serial to local TCP server.

Serial port to TCP local or remote server

Enable

yesno

Serial port settings

Baud rate

9600

Data bits

☐ 7
 ☒ 8

Stop bits

☒ 1
 ☐ 2

Parity

☒ none
 ☐ even
 ☐ odd
 ☐ mark
 ☐ space

Flow control

☒ none
 ☐ XON/XOFF
 ☐ CTS/RTS

TCP settings

TCP server is

LocalRemote

Hostname

RemoteServerIP

Port

8889

GPS to TCP local or TCP/UDP remote server

Enable

yesno

SaveReset

Advanced Editor

Figure 7: Serial to Remote TCP server.

On both configurations, one can find the configuration of the serial interface (**Serial port settings**):

- Baud rate
- Data bits
- Stops bits
- Parity
- Flow control

OPTION

These settings need to match the setting of the device connected to the serial interface.

On Figure 6, the CloudGate is running a local TCP server that will listen for incoming connections and forward them to the serial port. The Port number of the TCP server is, by default, **8889**, but it can be changed by the customer at any moment.

If access from the WAN interface (internet) is needed, an appropriate firewall rule needs to be in place to allow the connection to the port:

Edit inbound port forwarding rule

Protocol: TCP

Inbound interface: -- ALL --

Source IP: ☒ Any ☐ Specific:

Destination port: 8889

Target IP address: 192.168.1.1

Target destination port: 8889

Cancel Add

Figure 8: Inbound port forwarding rule.

NOTE: Recent versions of LuvitRED already open a firewall hole to allow remote access from the WAN interface. This can be verified only under the advanced editor, not on the basic interface (see section 3.2).

In Figure 7, the CloudGate will connect to a remote TCP server running on the specified port and send all the information that arrives from the device connected to the serial interface.

3 Modifying the configuration under the Advanced Editor.

After configuring the serial port under the basic interface, one can go to the Advance Editor and edit the configuration. The configuration made on the basic interface will be reflected under the Advanced editor in the following way:

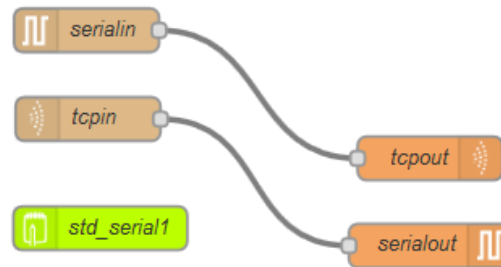


Figure 9: Same configuration under Advanced editor.

3.1 Serial interface from RS232 to RS485

Double click on the **serialin** node:

Figure 10: Serial node general configuration.

One can access the serial interface configuration by clicking on the pencil icon:

Figure 11: Serial interface configuration.

Clicking on the magnifying glass will give access to the interface selection:

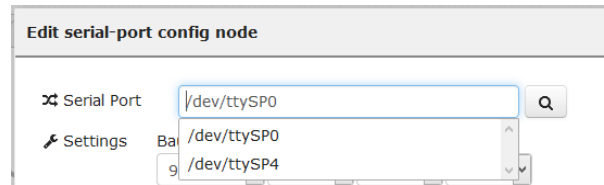


Figure 12: Interface selection.

Selecting the **/dev/ttySP4** interface will modify the configuration to work with the RS485 interface instead of the RS232 interface.

Click on Update, then on OK and then on Deploy (at the top right corner).

3.2 Verifying if firewall hole is opened by LuvitRED

Double click on the **tcpin** node:

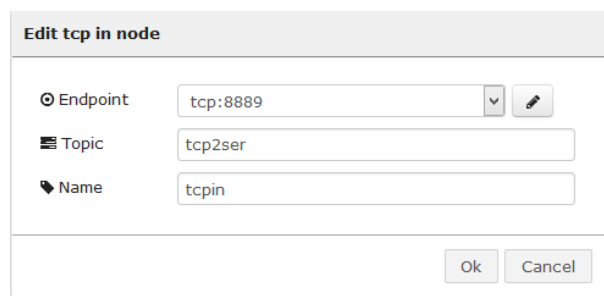


Figure 13: Tcpin node general configuration.

One can access the "Endpoint" configuration by clicking on the pencil icon:

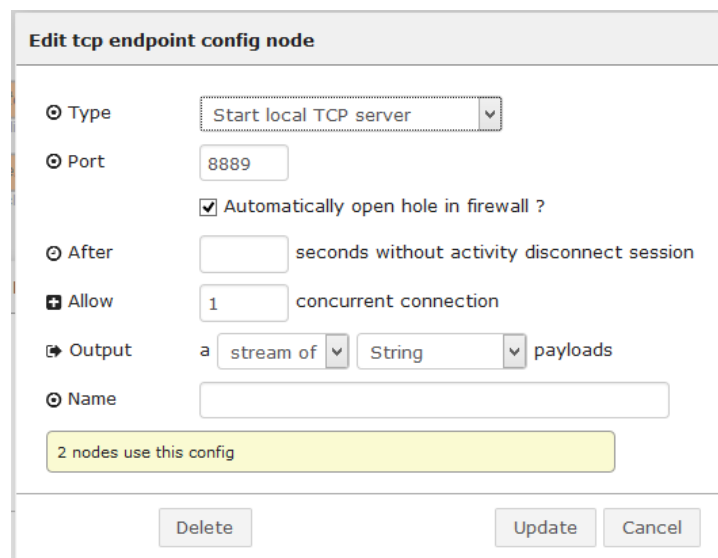


Figure 14: Endpoint configuration.

OPTION

Check if the configuration item called "Automatically open a hole in firewall?" is checked or modify it according to the needs of the configuration.

3.3 Inactivity timeout on the TCP node.

Open the "Endpoint" configuration as explained on section 3.2. Once there, add a timeout, in seconds (30 on the example below), on the "After ___ seconds without activity disconnect session" configuration item so that it closes any open connection that is not generating traffic:

Edit tcp endpoint config node

Type: Start local TCP server

Port: 8889

☒ Automatically open hole in firewall ?

After: 30 seconds without activity disconnect session

Allow: 1 concurrent connection

Output: a stream of String payloads

Name:

2 nodes use this config

Delete Update Cancel

Figure 15: Adding connection timeout.

4 Advanced Editor - Using RS232 and RS485 at the same time.

This section is only applicable to the industrial serial card (CG1102-11920).

To reduce deployment time, let's start from the configuration created using the basic interface of LuvitRED for the RS232 interface:

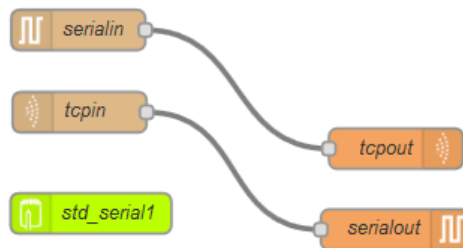


Figure 16: Basic configuration (RS232).

Click on the green **std_serial1** node and delete the node by using the delete key on the keyboard and then click on Deploy:

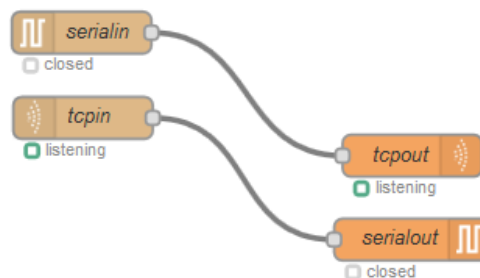


Figure 17: RS232 configuration without link to basic interface.

Select all nodes using the mouse pointer and then copy the node using CTRL+C and paste them again using CTRL+V into the Editor section of LuvitRED:

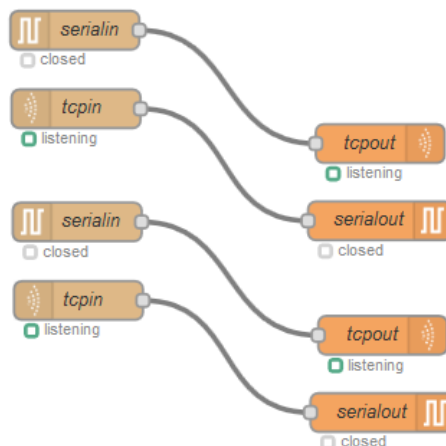
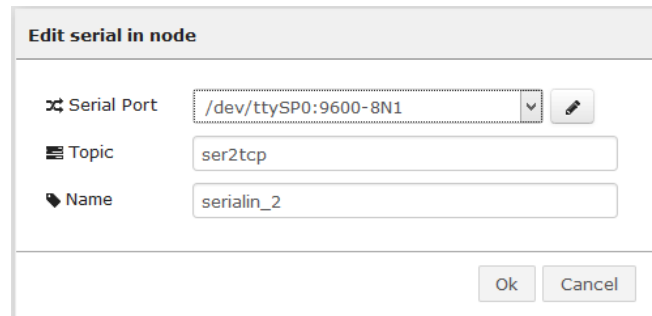


Figure 18: Copy and Paste the flow.

OPTION

Let's modify the name of the new nodes in order to avoid problems when editing them. To do that simply double click on the node to rename and change the configuration item called "Name":



The dialog box titled "Edit serial in node" contains three fields: "Serial Port" with a dropdown menu showing "/dev/ttySP0:9600-8N1" and a pencil icon; "Topic" with a text input field containing "ser2tcp"; and "Name" with a text input field containing "serialin_2". At the bottom right are "Ok" and "Cancel" buttons.

Figure 19: Renaming the tcpin node.

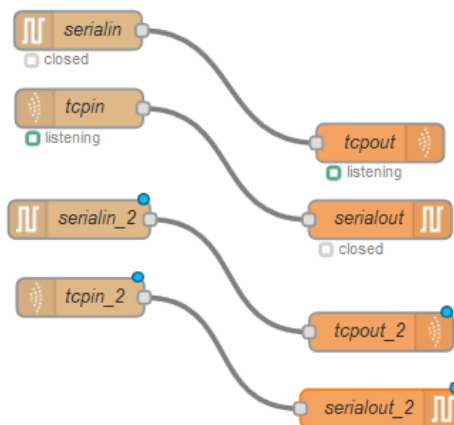


Figure 20: Renamed nodes.

Double click on the **serialin_2** node to edit the node and select "Add new serial-port", then click on the pencil icon:



The dialog box titled "Edit serial in node" is shown with the "Serial Port" dropdown menu open. The menu lists "/dev/ttySP0:9600-8N1" and "Add new serial-port...". The "Topic" field contains "/dev/ttySP0:9600-8N1" and the "Name" field contains "serialin_2". The "Ok" and "Cancel" buttons are at the bottom right.

Figure 21: Adding a new serial port.

Add new serial-port config node

Serial Port:

Settings: (dropdown menu open showing /dev/ttySP0, /dev/ttySP4)

Flow control:

Control lines:

RFC 2217:

☐ Start with port closed ?

Port mode:

Split input:

Figure 22: Adding the RS485 port.

Edit the RS485 according to your needs, then click on "Add" and then "OK".

Open the **serialout_2** node and select the newly created configuration for the RS485 interface:

Edit serial out node

Serial Port: (dropdown menu open showing /dev/ttySP0:9600-8N1, /dev/ttySP4:9600-8N1, Add new serial-port...)

Delay:

Name:

Figure 23: Select the configuration for the RS485 interface.

Click on "OK".

Open **tcpin_2** and select "Add a new tcp endpoint", then click on the pencil icon:

Edit tcp in node

Endpoint: (dropdown menu open showing tcp:8889, Add new tcp endpoint...)

Topic:

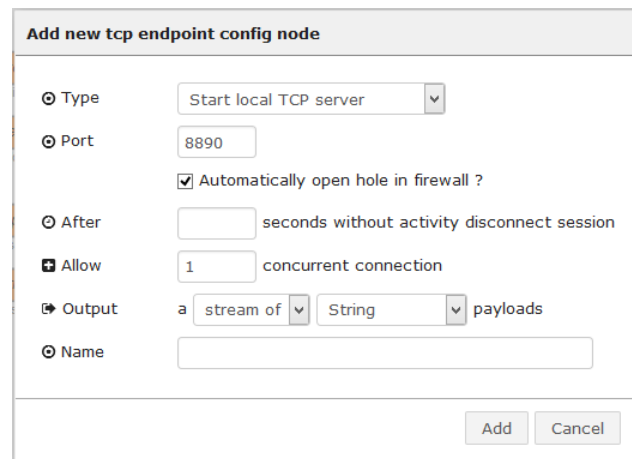
Name:

Figure 24: Adding a new tcp endpoint.

OPTION

Click on "OK".

Start a local TCP server, but on the port, make sure a different port number than the one used on the RS232 configuration is selected:

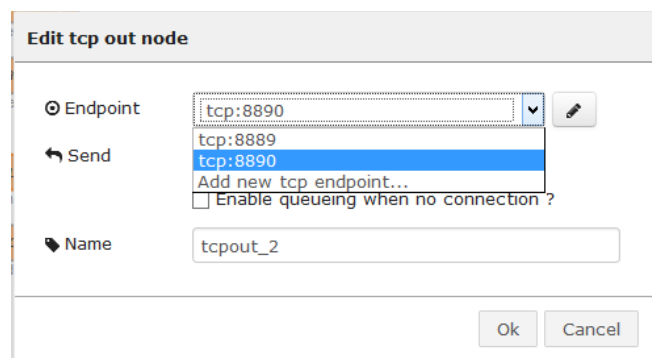


The dialog box is titled "Add new tcp endpoint config node". It contains several fields and a checkbox. The "Type" field is a dropdown menu with "Start local TCP server" selected. The "Port" field is a text box containing "8890". Below the port field is a checked checkbox labeled "Automatically open hole in firewall?". The "After" field is a text box followed by the text "seconds without activity disconnect session". The "Allow" field is a text box containing "1" followed by the text "concurrent connection". The "Output" field is a dropdown menu with "a" selected, followed by another dropdown menu with "stream of" selected, then a text box containing "String", and finally a dropdown menu with "payloads" selected. The "Name" field is a text box. At the bottom right are "Add" and "Cancel" buttons.

Figure 25: Local TCP server on port 8890.

Click on "Add" and then "OK".

Open the **tcpout_2** node and select the newly created TCP endpoint running on port 8890:



The dialog box is titled "Edit tcp out node". It contains an "Endpoint" field with a dropdown menu showing "tcp:8890". Below the dropdown is a list of options: "tcp:8889", "tcp:8890" (highlighted in blue), and "Add new tcp endpoint...". There is also a checkbox labeled "Enable queuing when no connection?". The "Name" field is a text box containing "tcpout_2". At the bottom right are "Ok" and "Cancel" buttons.

Figure 26: Select the new endpoint.

Press "OK" and Deploy the configuration.

OPTION

When looking at the "Configuration nodes" list one should see that four configuration nodes are available and that each of those are used by two nodes:

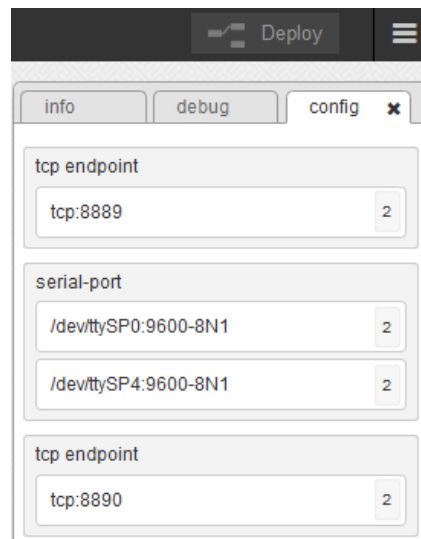


Figure 27: Configuration nodes view.

If the configuration was done correctly, access to the serial ports should be granted on TCP port 8889 for RS232 and TCP port 8890 for RS485.

○ ○
○ ○ P T I O N
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