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**Advantech IIoT Group**

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**Advantech TPC-100W Software**  
**Advanced Manual**

**Version <1.1>**

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Advanced Manual	Date: <04/14/2023>

## Revision History

Date	Version	Description
2023/04/14	1.1	1. Add how to run node-red 2. Add change boot logo
2023/03/16	1.0	1. Add chromium remote debug

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# 1. Chromium remote debug

Based on the principle of security, this function is only used for debugging .

## 1.1 Firewall setting

```
$ iptables -A INPUT -p tcp --dport 9222 -j ACCEPT
$ iptables -t nat -A PREROUTING -p tcp --dport 9222 -j DNAT --to-destination 127.0.0.1:9222
$ sysctl -w net.ipv4.conf.eth0.route_localnet=1
$ sysctl -w net.ipv4.conf.eth1.route_localnet=1
```

## 1.2 Add remote-debugging-port for chromium

modify the last line of /usr/bin/start\_chromium.sh

```
systemd-run --scope -p MemoryMax=1024M -p MemoryHigh=800M /usr/bin/chromium -
-no-sandbox --disable-gpu --test-type --enable-wayland-ime --start-maximized
--hide-crash-restore-bubble --remote-debugging-port=9222
```

then , Click top bar chromium icon to start chromium.

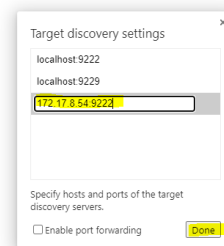
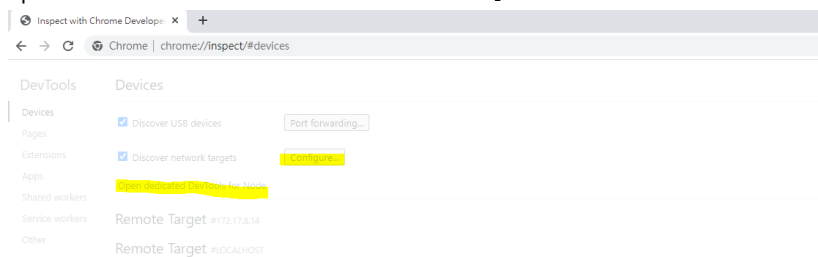


## 1.3 Use remote PC (Windows) and remote debug

Start google chrome and input “chrome://inspect “ to URL text field.

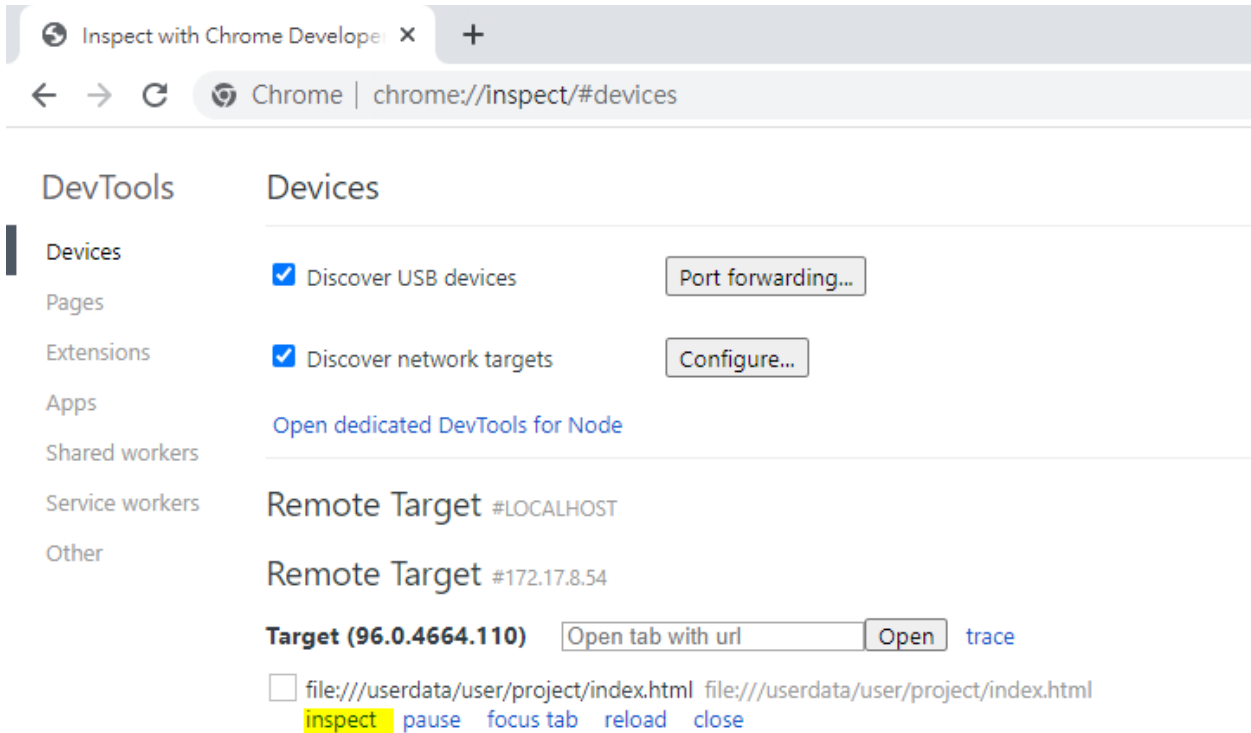
Click [Discover network target]→[Configure] and input the remote device IP:9222

Click [Open dedicated DevTools for Node]

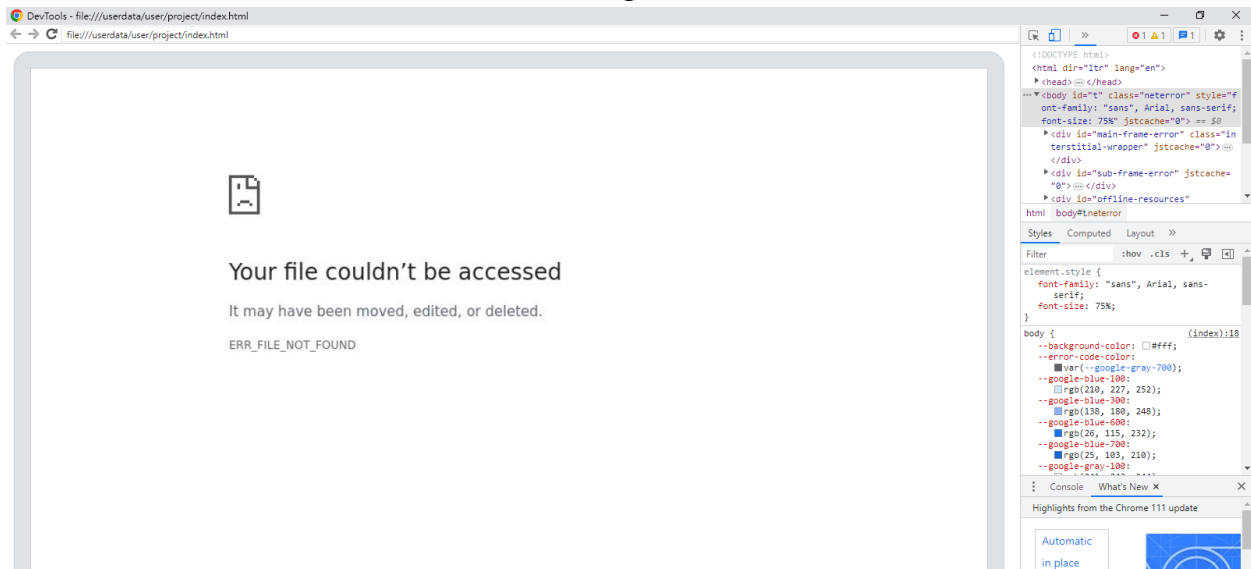


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You can see the remote device info, and click [inspect]



You can use [DevTools] to control and debug the chromium of the remote device.



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## 2. How to run node-red

### 2.1 Install Node Version Manager to manage multiple released Node.js versions.

Open terminal and use the following cURL command to download NVM , and run the profile , then close and reopen your terminal.

```
$ curl -o- https://raw.githubusercontent.com/nvm-sh/nvm/v0.39.3/install.sh
| bash
$ . ~/.profile
```

Install the latest version of Node.js ,

```
$ nvm install node      # "node" is an alias for the latest version
```

If you want to install a specific version of node (v16.20 is recommended)

```
$ nvm install 16 # or 14.7.0, 12.22.1, etc
```

If the installation is successful, you will see something like the following

```
root@eamb9918-0000000000005:~# nvm install 16
Downloading and installing node v16.20.0...
od: ../lib/systemd/systemd: No such file or directory
Downloading https://nodejs.org/dist/v16.20.0/node-v16.20.0-linux-arm64.tar.xz...
#####
Computing checksum with sha256sum
Checksums matched!
Now using node v16.20.0 (npm v8.19.4)
Creating default alias: default -> 16 (-> v16.20.0)
```

To switch between released versions. For example, if the version of Node.js is v16

```
$ nvm use 16
```

### 2.2 Install Node-RED package

Open terminal and input below command , For example, if the version of Node-RED is v3.0.2

```
$ npm install -g node-red@3.0.2 --unsafe-perm
```

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You can modify the version of node-red , refer : [node-red - npm \(npmjs.com\)](https://www.npmjs.com/package/node-red)

## 2.3 Firewall setting

You can insert a new rule with the specific port numbers , For example, if the port number is “1880”

```
$ iptables -A INPUT -p tcp --dport 1880 -j ACCEPT
```

After add a new iptables rule , you can input below command to check firewall setting

```
$ iptables -L
```

To save firewall setting permanently

```
$ iptables-save > /etc/iptables/iptables.rules
```

## 2.4 run Node-RED

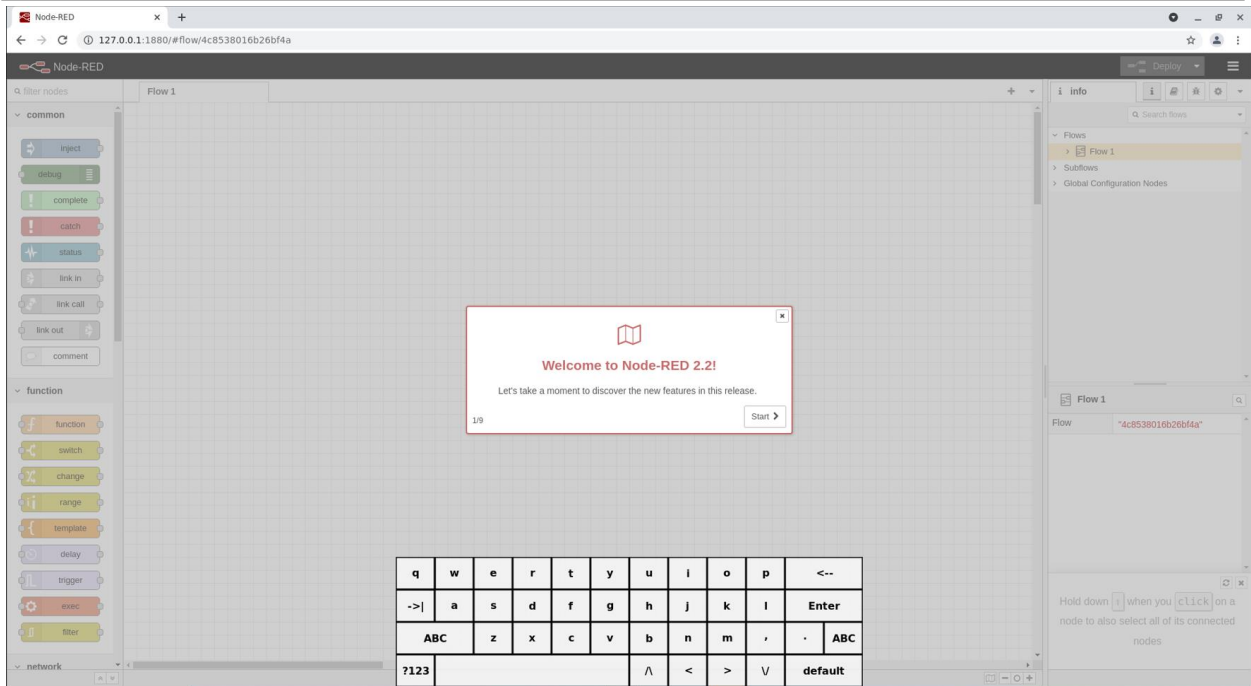
Start node-red with below command

```
$ node-red &
```

Open a browser on your PC and enter the URL : [http://<device\\_ip>:<port>](http://<device_ip>:<port>)

The <device\_ip> shown in the example is localhost on TPC-100W. If user need to remote access TPC-100W ,it must replace this <device\_ip> with the real IP address on network .

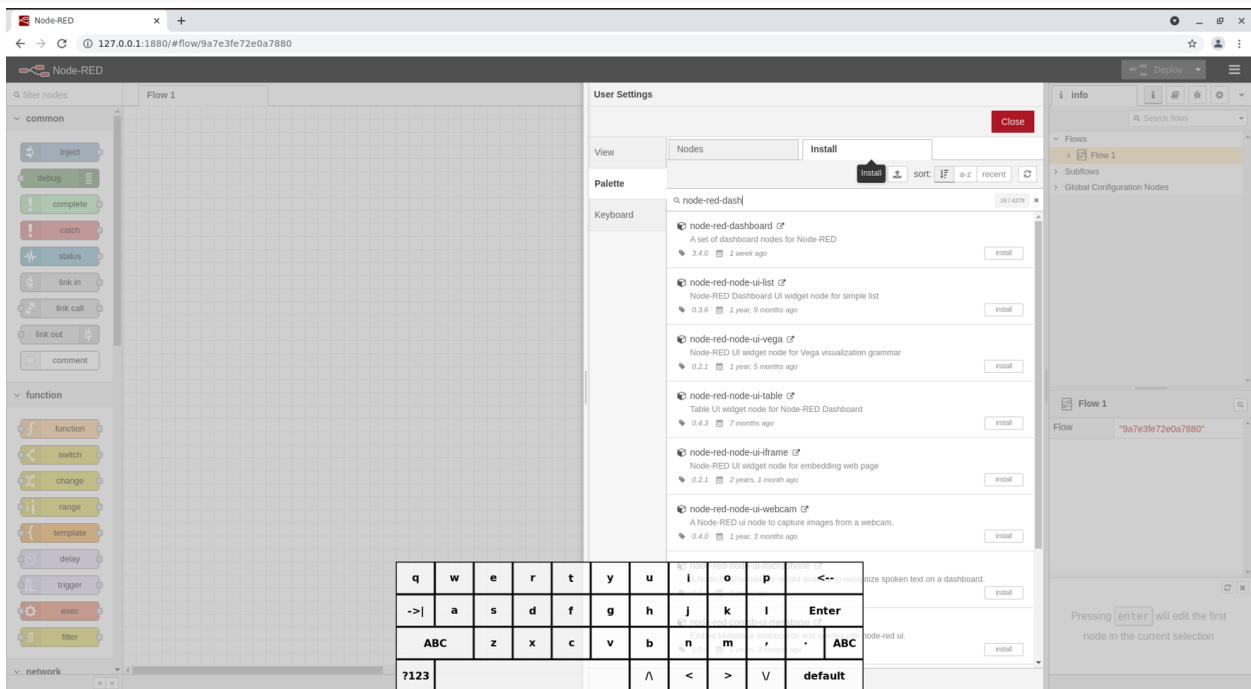
http://127.0.0.1:1880



## Run Dash-board

User setting -> palette-> install . Search for "node-red-dashboard" in the search window.

click it and install it .





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If you want to preview your changes, you can enter the following URL on browser

```
http://127.0.0.1:1880/ui
```

## 2.5 Starting Node-RED on boot

Using PM2 to run node-red if you want to automatically run node-red after booting,

Ref: <https://nodered.org/docs/faq/starting-node-red-on-boot>

Install PM2

```
$ npm install -g pm2
```

The following command tells PM2 to run Node-RED, assuming

“/home/root/.npm/versions/node/v20.2.0/bin/node-red” as the location of the node-red command

```
$ pm2 start /home/root/.npm/versions/node/v20.2.0/bin/node-red -- -v
```

Tell PM2 to run on boot

```
$ pm2 save  
$ pm2 startup
```

Finally, reboot and check everything starts as expected.

If you want remove init script

```
$ pm2 unstartup
```

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### 3. Change boot logo

You can change the boot logo as below after V1.5



The boot logo only support 24-bits bmp format and total 224 colors.

You can use commands as follows to transfer the bmp file to 224 colors.

```
# the logo.bmp is you want to change and you need try commands in Ubuntu.  
$ sudo apt install netpbm  
$ bmtoppm logo.bmp > logo.ppm  
$ pnmquant 224 logo.ppm > logo224.ppm  
$ ppmtobmp -windows -bpp 24 logo224.ppm > logo.bmp
```

Note that the valid logo image is (resolution\_width-20 x resolution\_height-20).

The last step is just copy logo.bmp to the first partition of emmc then reboot.

```
$ cp $YOUR_LOGO_PATH/logo.bmp /run/media/mmcblk2p1
```