WIRELESS SOLUTIONS

# Technical Seminar

## Agenda

## *WLINK Industrial Data Terminal Unit*

### *WL-D801*

- *Product Intro/ Key Features*
- *DTU Configuration Tool*
- *Work Modes – Online, Wakeup*
- *Automatic PPP Connection*
- *Automatic TCP/ UDP Connection*
- *Device Remote Management*

# WL-D801 Key Features

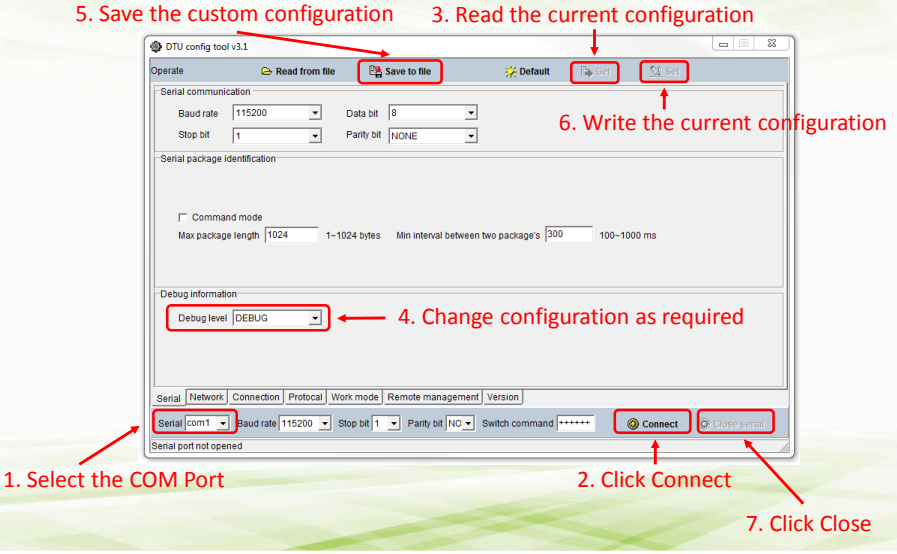
## Hardware Features

- ***DB9 3 pin RS232 Serial Port***
- *Single SIM Interface*
- *External SMA interface*
- ***GSM/GPRS***
- *Quad Band 850/900/1800/1900 MHz*
- *Speed: 85.6kbps*
- *Dimension: 70.5 x 55.5 x 22mm*
- *DC Jack Power Interface*
- *Operating Voltage: DC 5-26V*

## Software Features

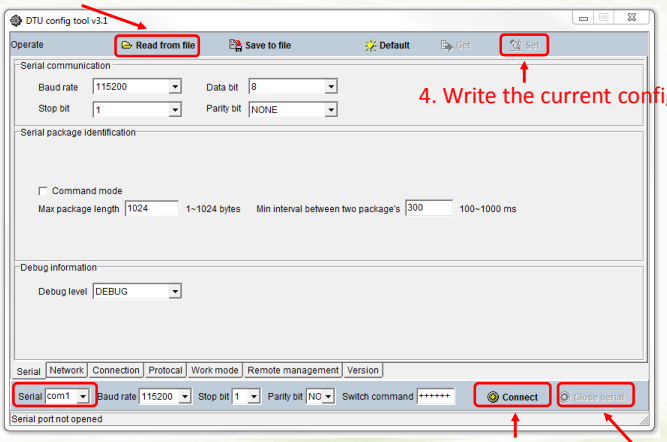
- ***DTU Configuration Tool***
- *Configuration Backup File*
- ***Transparent data sending***
- *Automatic PPP Connection*
- *Keep Alive Ping Check*
- *Automatic TCP/IP Client Connection*
- *Up to 3 server addresses*
- *Custom Server Heartbeat*
- ***M2M Monitoring Platform***

# WL-D801 DTU Configuration Tool – New Configuration



# WL-D801 DTU Configuration Tool – Restore Configuration

3. Read the configuration from a saved file




4. Write the current configuration

1. Select the COM Port

2. Click Connect

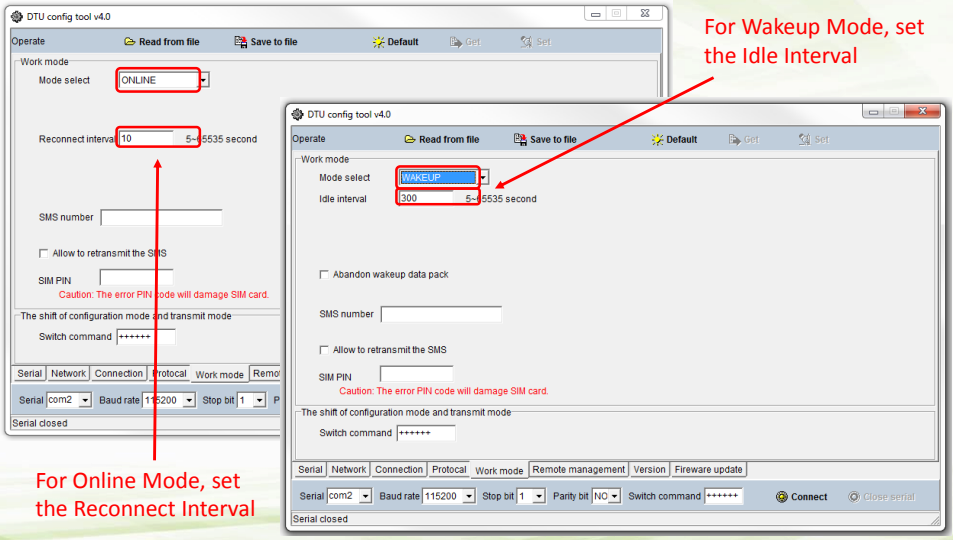
7. Click Close

# WL-D801 DTU Work Modes – ONLINE/ WAKEUP

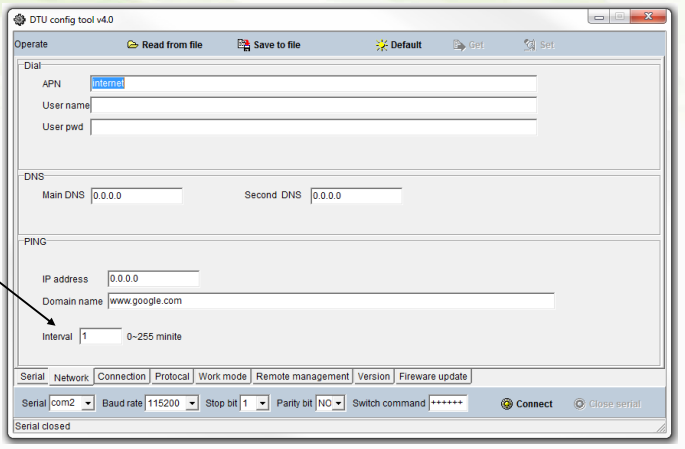
**ONLINE:** After the WL-D801 is powered on it will automatically connect to the configured data servers. If it disconnects for some reason, it will wait for the reconnection interval to expire before re-establishing the connection

**WAKEUP:** After the WL-D801 is powered on it will idle and wait for data to be received on the serial port. When data is received on the serial port it will automatically connect to the configured data servers. If there is no activity on the serial port for the configured idle interval the modem will disconnect from the data server and await for new data to arrive on the serial port.

# WL-D801 DTU Work Modes – ONLINE/ WAKEUP




# WL-D801 Automatic PPP Connection - ONLINE



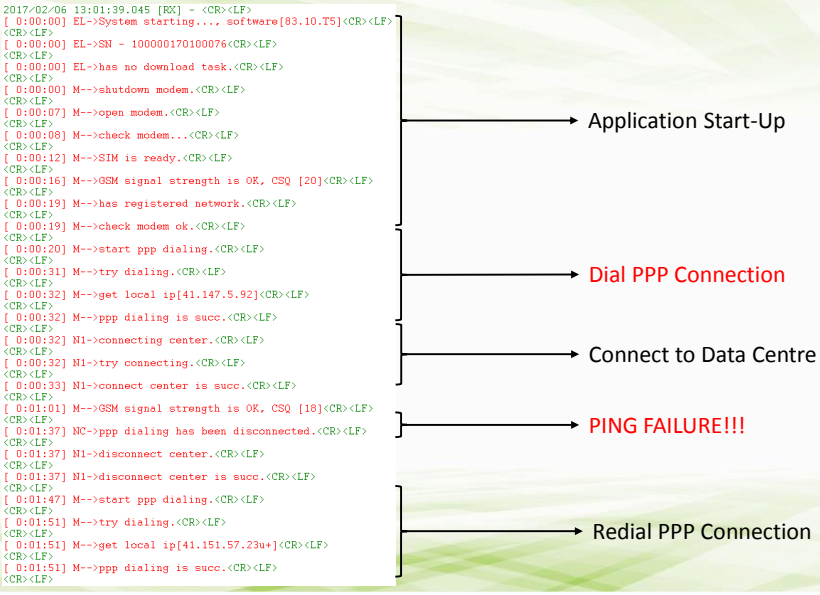

Once the PPP Dial Up has been established, each time the PING interval expires the modem will check connectivity to the configured destination address or domain

If there is no response after 3 PING attempts, the PPP Dial Up Connection will be disconnected

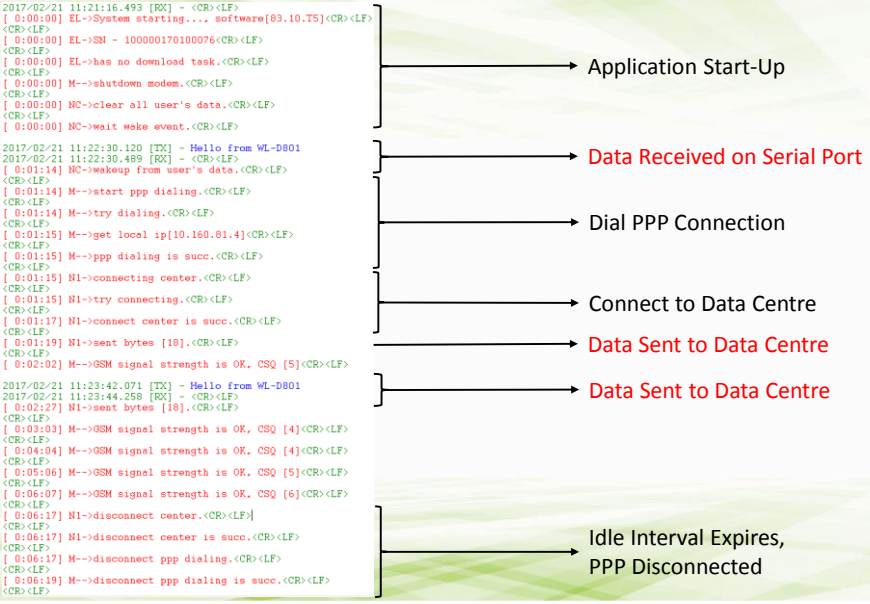
```
[ 0:01:32] AT: AT+CIPPING=www.google.com,3,32,7,64<CR>
<CR><LF>
[ 0:01:34] AT: <LF>
+CIPPING: 1,"216.58.223.36",2,57<CR>
<CR><LF>
```

After the reconnect interval expires the modem will re-dial the PPP connection and proceed with connecting to the configured data center

# WL-D801 Automatic PPP Connection - ONLINE

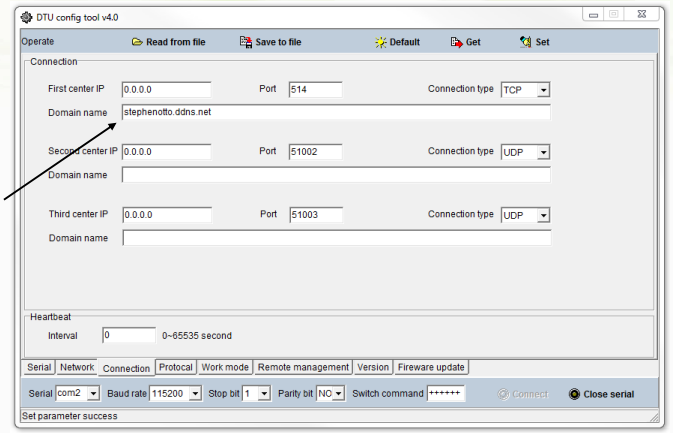



# WL-D801 Automatic PPP Connection - WAKEUP



# WL-D801 Automatic TCP Connection - ONLINE

Once the PPP Dial Up has been established the modem will create the connection to the configured data centre addresses or domains




NOTE: If the connection to the data centre's are unsuccessful, after 2 more connection attempts, the PPP connection will be disconnected and redialled

# WL-D801 Automatic TCP Connection (Debug Level = Debug Information)

```
2017/02/08 10:14:32.623 [RX] - <CR><LF>
[ 0:00:00] EL->System starting..., software[83.10.T5]<CR><LF>
<CR><LF>
[ 0:00:00] EL->SN - 100000170100076<CR><LF>
<CR><LF>
[ 0:00:00] EL->has no download task.<CR><LF>
<CR><LF>
[ 0:00:00] M-->shutdown modem.<CR><LF>
<CR><LF>
[ 0:00:07] M-->open modem.<CR><LF>
<CR><LF>
[ 0:00:08] M-->check modem...<CR><LF>
<CR><LF>
[ 0:00:12] M-->SIM is ready.<CR><LF>
<CR><LF>
[ 0:00:16] M-->GSM signal strength is OK, CSQ [15]<CR><LF>
<CR><LF>
[ 0:00:19] M-->has registered network.<CR><LF>
<CR><LF>
[ 0:00:19] M-->check modem ok.<CR><LF>
<CR><LF>
[ 0:00:20] M-->start ppp dialing.<CR><LF>
<CR><LF>
[ 0:00:31] M-->try dialing.<CR><LF>
<CR><LF>
[ 0:00:32] M-->get local ip[41.147.44.134<FF>
]<CR><LF>
<CR><LF>
[ 0:00:32] M-->ppp dialing is succ.<CR><LF>
<CR><LF>
[ 0:00:32] N1->connecting center.<CR><LF>
<CR><LF>
[ 0:00:32] N1->try connecting.<CR><LF>
<CR><LF>
[ 0:00:33] N1->connect center is succ.<CR><LF>

2017/02/08 10:15:10.967 [TX] - Hello TCP Server
2017/02/08 10:15:12.503 [RX] - <CR><LF>
[ 0:00:39] N1->sent bytes [16].<CR><LF>
<CR><LF>
[ 0:00:45] N1->recv data [42] from center:<CR><LF>
Hello WL-D801, I have received your data!!<CR><LF>

2017/02/08 10:15:20.939 [TX] - Hello TCP Server
2017/02/08 10:15:22.253 [RX] - <CR><LF>
[ 0:00:49] N1->sent bytes [16].<CR><LF>
<CR><LF>
[ 0:00:52] N1->recv data [42] from center:<CR><LF>
Hello WL-D801, I have received your data!!<CR><LF>
```

→ Application Start-Up

→ Dial PPP Connection

→ Connect to Data Centre

→ Send Data

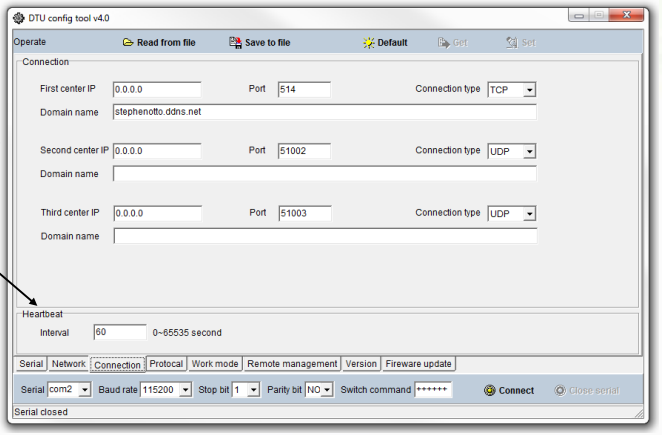
→ Receive Data

→ Send Data

→ Receive Data

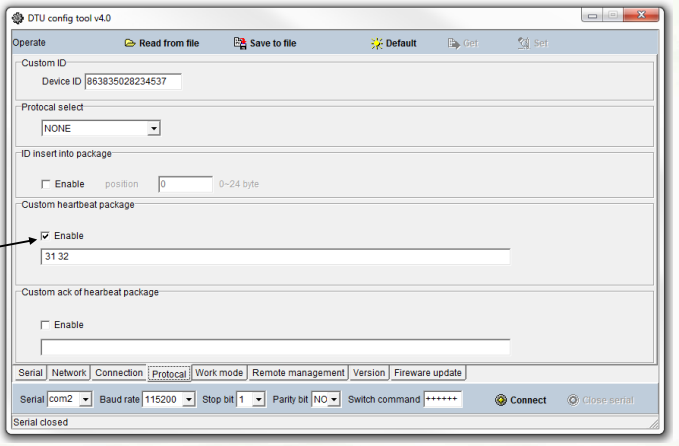
# WL-D801 Automatic TCP Connection (With Heartbeat)

Each time the configured heartbeat interval passes, the custom heartbeat packet is sent to the server




# WL-D801 Automatic TCP Connection (With Heartbeat)

Each time the configured heartbeat interval passes, the custom heartbeat packet is sent to the server



# WL-D801 Automatic TCP Connection (With Heartbeat) (Debug Level = Debug Information)

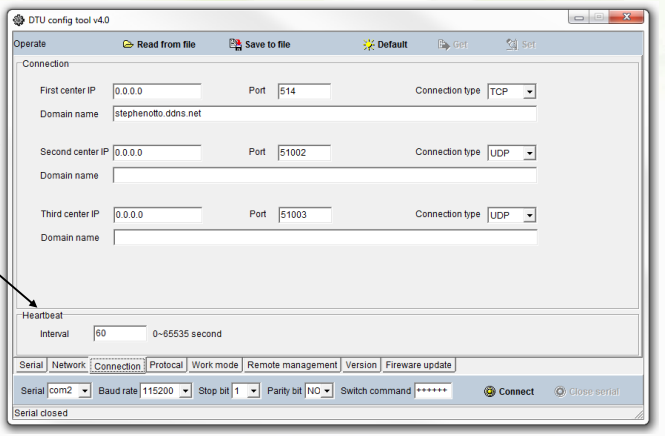
```
2017/02/08 10:22:54.965 [RX] - <CR><LF>
[ 0:00:00] EL->System starting..., software[83.10.T5]<CR><LF>
<CR><LF>
[ 0:00:00] EL->SN - 100000170100076<CR><LF>
<CR><LF>
[ 0:00:00] EL->has no download task.<CR><LF>
<CR><LF>
[ 0:00:00] M-->shutdown modem.<CR><LF>
<CR><LF>
[ 0:00:07] M-->open modem.<CR><LF>
<CR><LF>
[ 0:00:08] M-->check modem...<CR><LF>
<CR><LF>
[ 0:00:12] M-->SIM is ready.<CR><LF>
<CR><LF>
[ 0:00:16] M-->GSM signal strength is OK, CSQ [17]<CR><LF>
<CR><LF>
[ 0:00:19] M-->has registered network.<CR><LF>
<CR><LF>
[ 0:00:19] M-->check modem ok.<CR><LF>
<CR><LF>
[ 0:00:20] M-->start ppp dialing.<CR><LF>
<CR><LF>
[ 0:00:31] M-->try dialing.<CR><LF>
<CR><LF>
[ 0:00:32] M-->get local ip[197.228.242.50]<CR><LF>
<CR><LF>
[ 0:00:32] M-->ppp dialing is succ.<CR><LF>
<CR><LF>
[ 0:00:32] N1->connecting center.<CR><LF>
<CR><LF>
[ 0:00:32] N1->try connecting.<CR><LF>
<CR><LF>
[ 0:00:33] N1->connect center is succ.<CR><LF>
<CR><LF>
[ 0:00:33] N1->send heart beat packet.<CR><LF>
<CR><LF>
[ 0:00:34] N1->sent bytes [2].<CR><LF>
<CR><LF>
[ 0:01:01] M-->GSM signal strength is OK, CSQ [15]<CR><LF>
<CR><LF>
[ 0:01:34] N1->send heart beat packet.<CR><LF>
<CR><LF>
[ 0:01:35] N1->sent bytes [2].<CR><LF>

2017/02/08 10:24:32.135 [TX] - Hello TCP Server
2017/02/08 10:24:43.776 [RX] - <CR><LF>
[ 0:01:48] N1->sent bytes [16].<CR><LF>
<CR><LF>
[ 0:01:48] N1->recv data [42] from center:<CR><LF>
Hello WL-D801, I have received your data!!<CR><LF>
<CR><LF>
```

- Application Start-Up
- Dial PPP Connection
- Connect to Data Centre
- Send Heartbeat packet
- Send Heartbeat packet
- Send Data
- Receive Data

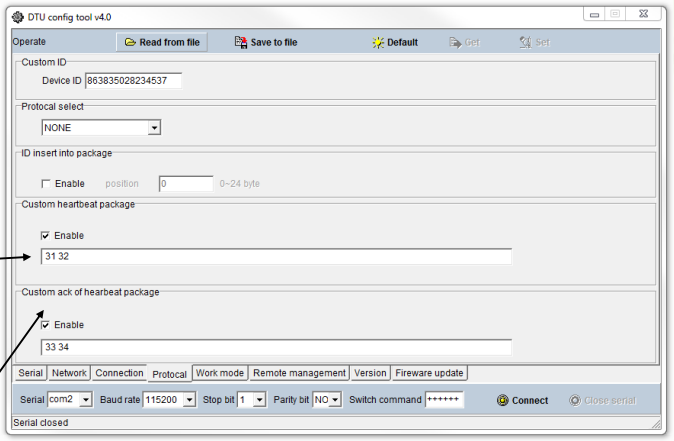
# WL-D801 Automatic TCP Connection (With Heartbeat and ACK)

Each time the configured heartbeat interval passes, the custom heartbeat packet is sent to the server



# WL-D801 Automatic TCP Connection (With Heartbeat and ACK)

Each time the configured heartbeat interval passes, the custom heartbeat packet is sent to the server




By enabling the "ACK of heartbeat package" then whenever the custom heartbeat packet is sent, the server must reply with the Hex Data configured as the heartbeat package. After 3 failed replies, PPP and TCP are disconnected!

# WL-D801 Automatic TCP Connection (With Heartbeat and ACK) (Debug Level = Debug Information)

```
2017/02/08 10:33:11.645 [RX] - <CR><LF>
[ 0:00:00] EL->System starting..., software[83.10.T5]<CR><LF>
<CR><LF>
[ 0:00:00] EL->SN - 100000170100076<CR><LF>
<CR><LF>
[ 0:00:00] EL->has no download task.<CR><LF>
<CR><LF>
[ 0:00:00] M-->shutdown modem.<CR><LF>
<CR><LF>
[ 0:00:07] M-->open modem.<CR><LF>
<CR><LF>
[ 0:00:08] M-->check modem...<CR><LF>
<CR><LF>
[ 0:00:12] M-->SIM is ready.<CR><LF>
<CR><LF>
[ 0:00:16] M-->GSM signal strength is OK, CSQ [16]<CR><LF>
<CR><LF>
[ 0:00:19] M-->has registered network.<CR><LF>
<CR><LF>
[ 0:00:19] M-->check modem ok.<CR><LF>
<CR><LF>
[ 0:00:20] M-->start ppp dialing.<CR><LF>
<CR><LF>
[ 0:00:31] M-->try dialing.<CR><LF>
<CR><LF>
[ 0:00:32] M-->get local ip[41.246.191.46<FF>
]<CR><LF>
<CR><LF>
[ 0:00:32] M-->ppp dialing is succ.<CR><LF>
<CR><LF>
[ 0:00:32] N1->connecting center.<CR><LF>
<CR><LF>
[ 0:00:32] N1->try connecting.<CR><LF>
<CR><LF>
[ 0:00:33] N1->connect center is succ.<CR><LF>
<CR><LF>
[ 0:00:33] N1->send heart beat packet.<CR><LF>
<CR><LF>
[ 0:00:34] N1->sent bytes [2].<CR><LF>
<CR><LF>
[ 0:00:36] N1->got heart beat ack.<CR><LF>

2017/02/08 10:33:52.776 [TX] - Hello TCP Server
2017/02/08 10:33:54.250 [RX] - <CR><LF>
[ 0:00:42] N1->sent bytes [16].<CR><LF>
<CR><LF>
[ 0:00:55] N1->recv data [40] from center:<CR><LF>
Hello WL-D801, I have received your data<CR><LF>
<CR><LF>
```

- Application Start-Up
- Dial PPP Connection
- Connect to Data Centre
- Send Heartbeat packet
- Receive Heartbeat ACK (33 34)
- Send Data
- Receive Data

# WL-D801 Automatic TCP Connection (With Heartbeat and ACK) (Debug Level = Debug Information)

```
2017/02/08 10:47:26.465 [RX] - <CR><LF>
[ 0:00:00] EL->System starting..., software[83.10.T5]<CR><LF>
<CR><LF>
[ 0:00:00] EL->SN = 100000170100076<CR><LF>
<CR><LF>
[ 0:00:00] EL->has no download task.<CR><LF>
<CR><LF>
[ 0:00:00] M-->shutdown modem.<CR><LF>
<CR><LF>
[ 0:00:07] M-->open modem.<CR><LF>
<CR><LF>
[ 0:00:08] M-->check modem...<CR><LF>
<CR><LF>
[ 0:00:12] M-->SIM is ready.<CR><LF>
<CR><LF>
[ 0:00:16] M-->GSM signal strength is OK, CSQ [15]<CR><LF>
<CR><LF>
[ 0:00:19] M-->has registered network.<CR><LF>
<CR><LF>
[ 0:00:19] M-->check modem ok.<CR><LF>
<CR><LF>
[ 0:00:20] M-->start ppp dialing.<CR><LF>
<CR><LF>
[ 0:00:31] M-->try dialing.<CR><LF>
<CR><LF>
[ 0:00:32] M-->get local ip[41.146.92.36_<FF>
]<CR><LF>
<CR><LF>
[ 0:00:32] M-->ppp dialing is succ.<CR><LF>
<CR><LF>
[ 0:00:32] N1->connecting center.<CR><LF>
<CR><LF>
[ 0:00:32] N1->try connecting.<CR><LF>
<CR><LF>
[ 0:00:33] N1->connect center is succ.<CR><LF>
<CR><LF>
[ 0:00:33] N1->send heart beat packet.<CR><LF>
<CR><LF>
[ 0:00:34] N1->sent bytes [2].<CR><LF>
<CR><LF>
[ 0:00:40] N1->sent bytes [2].<CR><LF>
<CR><LF>
[ 0:00:46] N1->sent bytes [2].<CR><LF>
<CR><LF>
[ 0:00:51] N1->heart beat failed.<CR><LF>
<CR><LF>
[ 0:00:51] N1->disconnect center.<CR><LF>
<CR><LF>
[ 0:00:52] N1->disconnect center is succ.<CR><LF>
<CR><LF>
[ 0:00:52] M-->disconnect ppp dialing.<CR><LF>
<CR><LF>
[ 0:00:52] M-->disconnect ppp dialing is succ.<CR><LF>
```

Application Start-Up

Dial PPP Connection

Connect to Data Centre

Send Heartbeat packet

Send Heartbeat packet

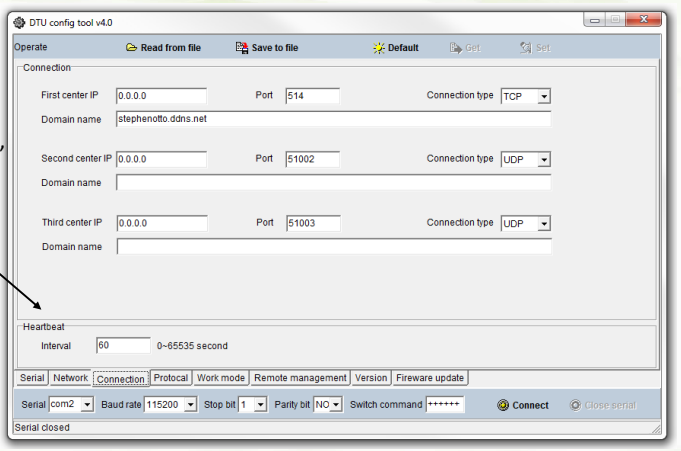
Send Heartbeat packet

No Heartbeat ACK received!!!

Disconnect PPP and TCP

# WL-D801 Automatic TCP Connection (With Heartbeat and ID and ACK)

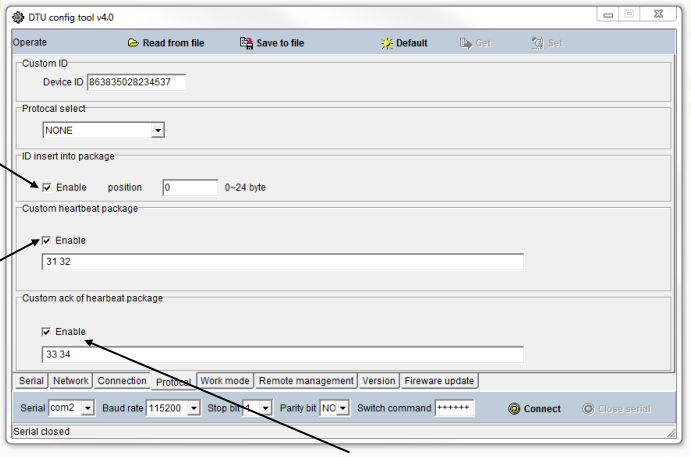
Each time the configured heartbeat interval passes, the custom heartbeat packet is sent to the server



# WL-D801 Automatic TCP Connection (With Heartbeat and ID and ACK)

By enabling the "ID insert into package" then whenever the custom heartbeat packet is sent, the Device ID is appended to the packet accordingly

Each time the configured heartbeat interval passes, the custom heartbeat packet is sent to the server




By enabling the "ACK of heartbeat package" then whenever the custom heartbeat packet is sent, the server must respond with the Hex Data configured as the heartbeat package. If Insert ID is enabled, the heartbeat ACK must also include the custom ID!!

# WL-D801 Automatic TCP Connection (With Heartbeat and ID and ACK) (Debug Level = Debug Information)

```
<CR><LF>
[ 0:00:00] EL->System starting..., software[83.10.T5]<CR><LF>
<CR><LF>
[ 0:00:00] EL->SN - 100000170100076<CR><LF>
<CR><LF>
[ 0:00:00] EL->has no download task.<CR><LF>
<CR><LF>
[ 0:00:00] M-->shutdown modem.<CR><LF>
<CR><LF>
[ 0:00:07] M-->open modem.<CR><LF>
<CR><LF>
[ 0:00:08] M-->check modem...<CR><LF>
<CR><LF>
[ 0:00:12] M-->SIM is ready.<CR><LF>
<CR><LF>
[ 0:00:16] M-->GSM signal strength is OK, CSQ [15]<CR><LF>
<CR><LF>
[ 0:00:19] M-->has registered network.<CR><LF>
<CR><LF>
[ 0:00:19] M-->check modem ok.<CR><LF>
<CR><LF>
[ 0:00:20] M-->start ppp dialing.<CR><LF>
<CR><LF>
[ 0:00:31] M-->try dialing.<CR><LF>
<CR><LF>
[ 0:00:32] M-->get local ip[154.69.121.29<FF>
]<CR><LF>
<CR><LF>
[ 0:00:32] M-->ppp dialing is succ.<CR><LF>
<CR><LF>
[ 0:00:32] N1->connecting center.<CR><LF>
<CR><LF>
[ 0:00:32] N1->try connecting.<CR><LF>
<CR><LF>
[ 0:00:35] N1->connect center is succ.<CR><LF>
<CR><LF>
[ 0:00:35] N1->send heart beat packet.<CR><LF>
<CR><LF>
[ 0:00:36] N1->sent bytes [17].<CR><LF>
<CR><LF>
[ 0:00:38] N1->got heart beat ack.<CR><LF>

2017/02/08 10:39:58.102 [TX] - Hello TCP Server
2017/02/08 10:39:59.493 [RX] - <CR><LF>
[ 0:00:57] N1->sent bytes [16].<CR><LF>
<CR><LF>
[ 0:01:01] M-->GSM signal strength is OK, CSQ [15]<CR><LF>
<CR><LF>
[ 0:01:12] N1->recv data [40] from center:<CR><LF>
Hello WL-D801, I have received your data<CR><LF>
```

- Application Start-Up
- Dial PPP Connection
- Connect to Data Centre
- Send Heartbeat packet
- Receive Heartbeat ACK (38 36 33 38 33 35 30 32 38 32 33 34 35 33 37 33 34)
- Send Data
- Receive Data

# WL-D801 Automatic TCP Connection (With Heartbeat and ID and ACK) (Debug Level = Debug Information)

```
2017/02/08 10:45:16.048 [RX] - <CR><LF>
[ 0:00:00] EL->System starting..., software[83.10.T5]<CR><LF>
<CR><LF>
[ 0:00:00] EL->SN - 100000170100076<CR><LF>
<CR><LF>
[ 0:00:00] EL->has no download task.<CR><LF>
<CR><LF>
[ 0:00:00] M-->shutdown modem.<CR><LF>
<CR><LF>
[ 0:00:07] M-->open modem.<CR><LF>
<CR><LF>
[ 0:00:08] M-->check modem...<CR><LF>
<CR><LF>
[ 0:00:12] M-->SIM is ready.<CR><LF>
<CR><LF>
[ 0:00:16] M-->GSM signal strength is OK, CSQ [15]<CR><LF>
<CR><LF>
[ 0:00:19] M-->has registered network.<CR><LF>
<CR><LF>
[ 0:00:20] M-->check modem ok.<CR><LF>
<CR><LF>
[ 0:00:20] M-->start ppp dialing.<CR><LF>
<CR><LF>
[ 0:00:31] M-->try dialing.<CR><LF>
<CR><LF>
[ 0:00:32] M-->get local ip[41.148.1.248i<FF>
]<CR><LF>
<CR><LF>
[ 0:00:32] M-->ppp dialing is succ.<CR><LF>
<CR><LF>
[ 0:00:32] N1->connecting center.<CR><LF>
<CR><LF>
[ 0:00:32] N1->try connecting.<CR><LF>
<CR><LF>
[ 0:00:33] N1->connect center is succ.<CR><LF>
<CR><LF>
[ 0:00:33] N1->send heart beat packet.<CR><LF>
<CR><LF>
[ 0:00:34] N1->sent bytes [17].<CR><LF>
<CR><LF>
[ 0:00:40] N1->sent bytes [17].<CR><LF>
<CR><LF>
[ 0:00:46] N1->sent bytes [17].<CR><LF>
<CR><LF>
[ 0:00:51] N1->heart beat failed.<CR><LF>
<CR><LF>
[ 0:00:51] N1->disconnect center.<CR><LF>
<CR><LF>
[ 0:00:51] N1->disconnect center is succ.<CR><LF>
<CR><LF>
[ 0:00:51] M-->disconnect ppp dialing.<CR><LF>
<CR><LF>
[ 0:00:52] M-->disconnect ppp dialing is succ.<CR><LF>
```

Application Start-Up

Dial PPP Connection

Connect to Data Centre

Send Heartbeat packet

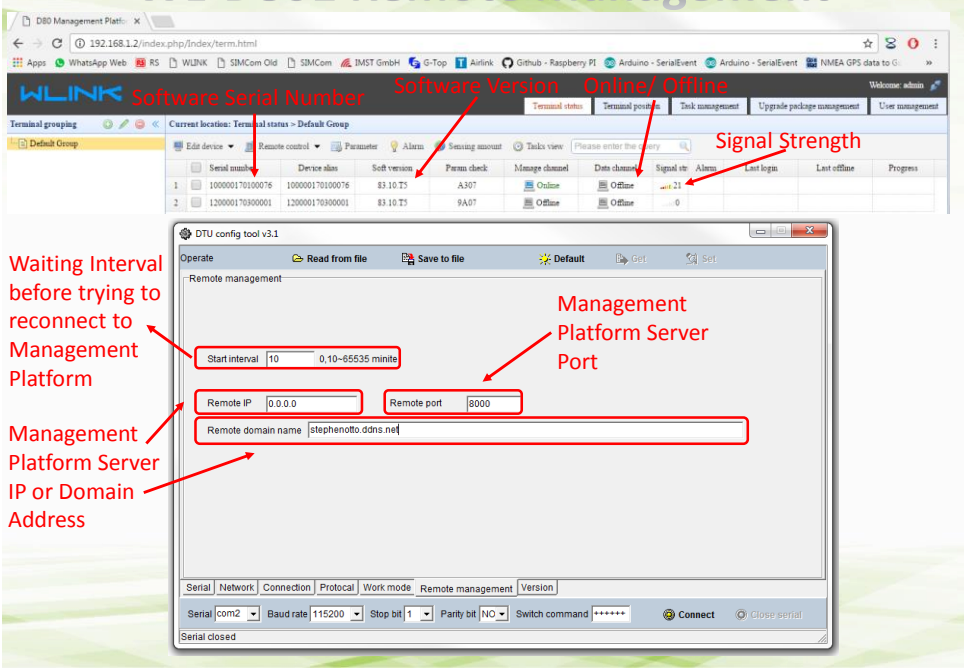
Send Heartbeat packet

Send Heartbeat packet

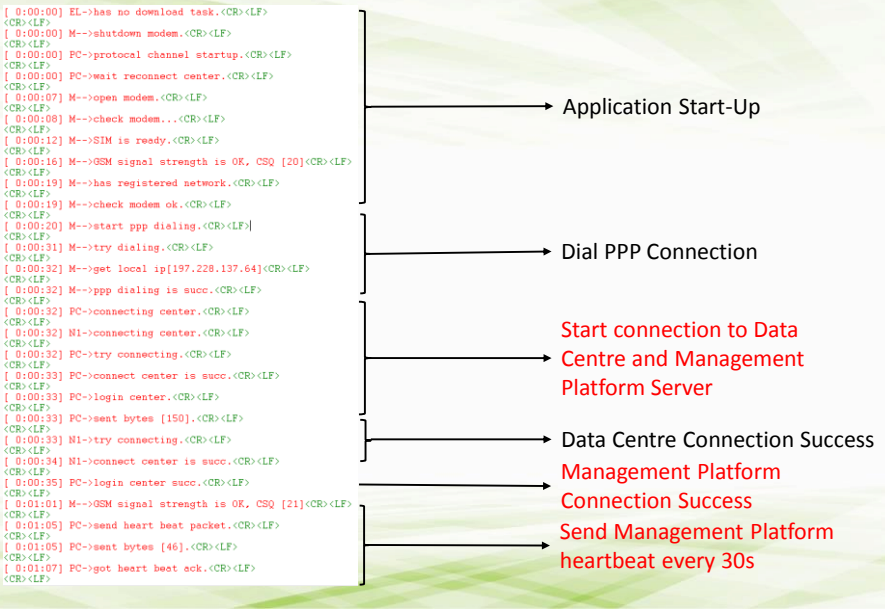
No Heartbeat ACK received!!!

Disconnect PPP and TCP

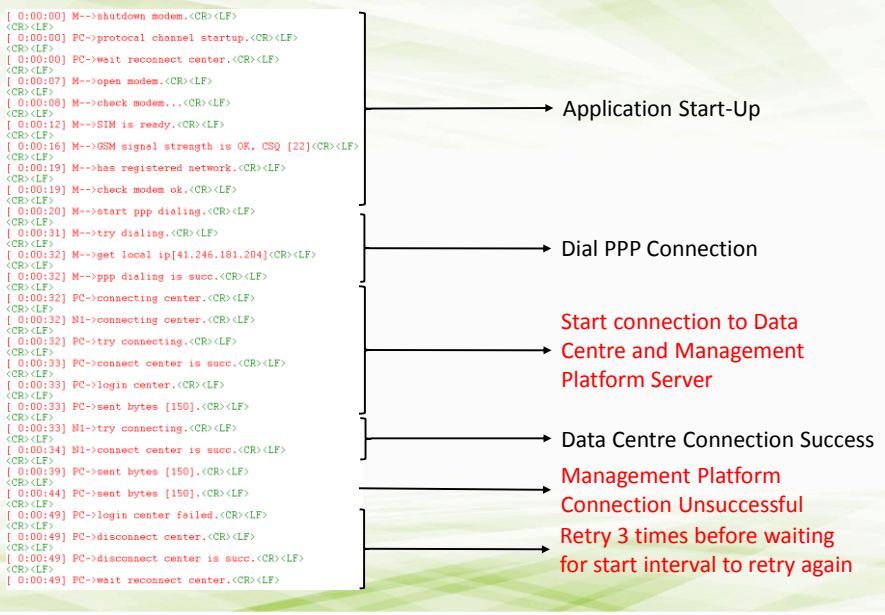
# WL-D801 Remote Management



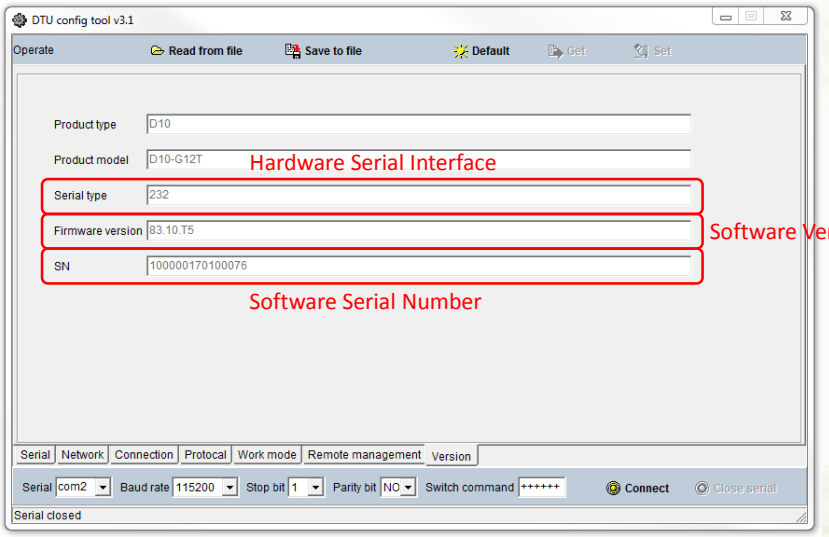
# WL-D801 Remote Management




# WL-D801 Remote Management



# WL-D801 Modem Information




*Thank you so much for taking the time out of your schedule to join us for our Technical Seminar!!*

*WL-D801 Documentation Download Link:*

https://drive.google.com/drive/folders/0B7gJpwTcYsRZcV9PVnBGY2NyNVU?usp=sharing

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