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# PDS/tDS-700 Series

## Linux User Manual

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## 1. PDS/tDS-700 Static Library Function Description

Before user use the library, user should configure and check the network configuration of PDS/tDS-700 module with demo “eSearch” first. The static library is the collection of function calls of the PDS/tDS-700 series for linux kernel 2.6.x system. The application structure is presented as below figure “Figure 1-1”. The user application program developed by C (C++) language can call library “libpds700.a” for x86 or “libpds700\_64.a” for x64 linux PC. And then static library will call the module command to access the hardware system.

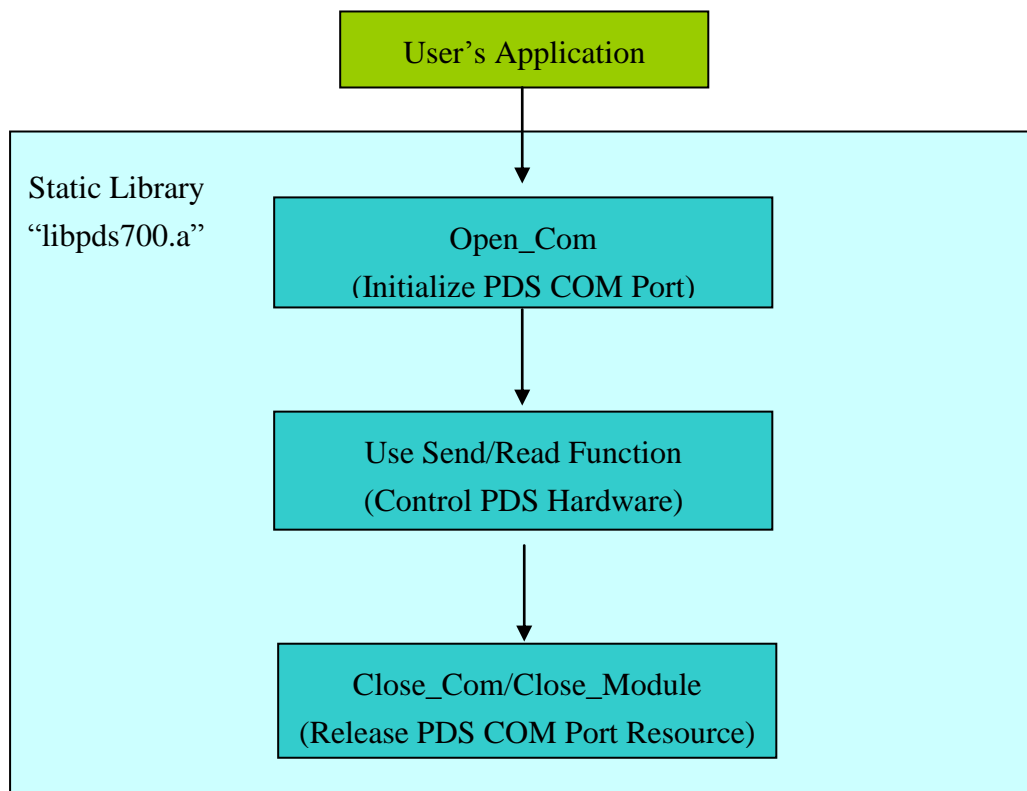


Figure 1-1

## 1.1 Table of ErrorCode and ErrorString

Table 1.1

Error Code	Error ID	Error String
0	PDS700_NOERROR	OK ( No error !)
1	PDS700_OPENCOMERROR	Initializing PDS COM error
2	PDS700_CMDPORTERROR	The PDS/tDS-700 command port over range
3	PDS700_COMNUMBERERROR	The PDS/tDS-700 COM port over range
4	PDS700_OPENSOCKETERROR	Creating socket error
5	PDS700_CONNECTSOCKETERROR	Connecting socket error
6	PDS700_GETHOSTNAMEERROR	Getting PDS/tDS-700 host name error
7	PDS700_SETCOMBAUDERROR	Setting the baud rate of COM port error
8	PDS700_SETCOMDATAFORMATERROR	Setting the data format of COM port error
9	PDS700_SETCMDRETURNMODEERROR	Setting the response mode of PDS/tDS-700 error
10	PDS700_CLOSECOMSOCKETERROR	Closing COM socket error
11	PDS700_CLOSECMDSOCKETERROR	Closing command socket error
12	PDS700_SENDSTRINGERROR	Sending string from the PDS/tDS-700 COM port error
13	PDS700_READSTRINGERROR	Reading string from the PDS/tDS-700 COM port error
14	PDS700_SETSERVERIPERROR	Setting the IP address of PDS/tDS-700 error
15	PDS700_SETSERVERGATEWAYERROR	Setting the gateway of PDS/tDS-700 error
16	PDS700_SETSERVERSUBMASKER	Setting the sub-network

	ROR	mask of PDS/tDS-700 error
17	PDS700_NORESPONSE	The PDS/tDS-700 no response

## 1.2 Function Descriptions

Table 1.2

Library Function
WORD Open_Com(pds_mod_t *PDSMod, char *ServerIP, WORD CommandPort, WORD ServerCOM, DWORD Baudrate, BYTE Data, BYTE Parity, BYTE Stop);
WORD Close_Com(pds_mod_t *PDSMod, WORD ServerCOM);
WORD Open_CAN(pds_mod_t *PDSMod, char *ServerIP);
WORD Close_CAN(pds_mod_t *PDSMod);
WORD Close_Module(pds_mod_t *PDSMod);
char * Get_PDS_Library_Version(void);
WORD Get_PDS_MiniOS_Version(pds_mod_t *PDSMod, char *MiniOSVer);
WORD Get_PDS_Vxcomm_Version(pds_mod_t *PDSMod, char *VxcommVer);
WORD Get_PDS_Module_Name(pds_mod_t *PDSMod, char *ModuleName);
WORD Get_PDS_COM_Info(pds_mod_t *PDSMod, WORD ServerCOM);
WORD Get_PDS_Server_Network_Info(pds_mod_t *PDSMod);
WORD Reset_PDS_Module(pds_mod_t *PDSMod);
WORD Set_PDS_Server_IP(pds_mod_t *PDSMod, char *NewServerIP);
WORD Set_PDS_Server_Gateway(pds_mod_t *PDSMod, char *NewServerGateway);
WORD Set_PDS_Server_SubMask(pds_mod_t *PDSMod, char *NewServerSubMask);
WORD Send_Read_String(pds_mod_t *PDSMod, WORD ServerCOM, char Out_String[], char In_String[]);
WORD Send_String(pds_mod_t *PDSMod, WORD ServerCOM, char Out_String[]);

WORD Read_String(pds_mod_t *PDSMod, WORD ServerCOM, char In_String[]);
WORD Send_Modbus(pds_mod_t *PDSMod, WORD ServerCOM, char Out_String[], char Out_len);
WORD Read_Modbus(pds_mod_t *PDSMod, WORD ServerCOM, char In_String[], char In_len);
WORD Send_Binary(pds_mod_t *PDSMod, WORD ServerCOM, char Out_String[], int len);
WORD Read_Binary(pds_mod_t *PDSMod, WORD ServerCOM, char In_String[], int len);
WORD Send_CAN_Msg(pds_mod_t *PDSMod, char* can_msg);
WORD Read_CAN_Msg(pds_mod_t *PDSMod, char *In_String);

---

## 1.3 Library FUNCTIONS

---

### 1.3.1 Open\_Com

- **Description:**

This function is used to configure and open a PDS/tDS-700 Server COM port for service by Ethernet. The COM port must be called up before users can begin sending/receiving commands through it.

- **Syntax:**

WORD Open\_Com(pds\_mod\_t \*PDSMod, char \*ServerIP, WORD CommandPort, WORD ServerCOM, DWORD Baudrate, BYTE Data, BYTE Parity, BYTE Stop);

- **Parameter:**

PDSMod: [output] A structure pointer.

ServerIP: [input] The IP address of PDS/tDS-700 server.

CommandPort: [input] PDS/tDS-700 command port is 10000.

ServerCOM: [input] The number of PDS/tDS-700 COM port.

Baudrate: [input] The baud of PDS/tDS-700 COM port.

Data: [input] 5/6/7/8 data bit

Parity: [input] 0=None Parity, 1=Odd Parity, 2=Even Parity

Stop: [input] 1=1-stop, 2=2-stop

- **Return:**

Return 0 means success, others means failure (Please refer to "Section 1.1 Error Code").

---

### 1.3.2 Close\_Com

- **Description:**

This function is used to close and release COM port resources. It must be called before exiting the application program.

- **Syntax:**

WORD Close\_Com(pds\_mod\_t \*PDSMod, WORD ServerCOM);

- **Parameter:**

PDSMod: [input] A structure pointer.

ServerCOM: [input] The number of PDS/tDS-700 COM port.

- **Return:**

Return 0 means success, others means failure (Please refer to "Section



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1.1 Error Code").

---

### 1.3.3 Open\_CAN

- **Description:**  
Open CAN device for service by Ethernet (support I-7054D for now).  
You should call up before send & read can messages.
- **Syntax:**  
WORD Open\_CAN(pds\_mod\_t \*PDSMod, char \*ServerIP)
- **Parameter:**  
PDSMod: [input] A structure pointer.  
ServerIP: [input] The IP address of PDS/tDS-700 server
- **Return:**  
Return 0 means success, others means failure (Please refer to "Section 1.1 Error Code").

---

### 1.3.4 Close\_CAN

- **Description:**  
This function is used to close and release CAN port resources.  
It must be called before exiting the application program.
- **Syntax:**  
WORD Close\_CAN(pds\_mod\_t \*PDSMod)
- **Parameter:**  
PDSMod: [input] A structure pointer.
- **Return:**  
Return 0 means success, others means failure (Please refer to "Section 1.1 Error Code").

---

### 1.3.5 Close\_Module

- **Description:**  
To release PDS/tDS-700 module and all COM ports resources.
- **Syntax:**  
WORD Close\_Module(pds\_mod\_t \*PDSMod);
- **Parameter:**  
PDSMod: [input] A structure pointer.
- **Return:**  
Return 0 means success, others means failure (Please refer to "Section 1.1 Error Code").

---

### 1.3.6 Get\_PDS\_Library\_Version

- **Description :**  
To get the version of PDS/tDS-700 linux library.
- **Syntax :**  
char \* Get\_PDS\_Library\_Version(void);
- **Parameter :**  
None
- **Return:**  
Return the PDS/tDS-700 library version.

---

### 1.3.7 Get\_PDS\_MiniOS\_Version

- **Description :**  
To read the MiniOS7 version of PDS/tDS-700 server.
- **Syntax :**  
WORD Get\_PDS\_MiniOS\_Version(pds\_mod\_t \*PDSMod, char \*MiniOSVer);
- **Parameter :**  
PDSMod: [input] A structure pointer.  
MiniOSVer: [output] The MiniOS7 version of PDS/tDS-700 server.
- **Return:**  
Return 0 means success, others means failure (Please refer to "Section 1.1 Error Code").

---

### 1.3.8 Get\_PDS\_Vxcomm\_Version

- **Description :**  
To read the VxComm.exe version of PDS/tDS-700 server.
- **Syntax :**  
WORD Get\_PDS\_Vxcomm\_Version(pds\_mod\_t \*PDSMod, char \*VxcommVer);
- **Parameter :**  
PDSMod: [input] A structure pointer.  
VxcommVer: [output] The VxComm.exe version of PDS/tDS-700 server.
- **Return:**  
Return 0 means success, others means failure (Please refer to "Section 1.1 Error Code").

---

### 1.3.9 Get\_PDS\_Module\_Name

- **Description :**  
To read the PDS/tDS-700 module name.
- **Syntax :**  
WORD Get\_PDS\_Module\_Name(pds\_mod\_t \*PDSMod, char \*ModuleName);
- **Parameter :**  
PDSMod: [input] A structure pointer.  
ModuleName: [output] The name of PDS/tDS-700 module.
- **Return:**  
Return 0 means success, others means failure (Please refer to "Section 1.1 Error Code").

---

### 1.3.10 Get\_PDS\_COM\_Info

- **Description :**  
To read the COM port Configuration of PDS/tDS-700 server.
- **Syntax :**  
WORD Get\_PDS\_COM\_Info(pds\_mod\_t \*PDSMod, WORD ServerCOM);
- **Parameter :**  
PDSMod: [input] A structure pointer.  
ServerCOM: [input] The number of PDS/tDS-700 COM port.
- **Return:**  
Return 0 means success, others means failure (Please refer to "Section 1.1 Error Code").

---

### 1.3.11 Get\_PDS\_Server\_Network\_Info

- **Description :**  
To read the network configuration of PDS/tDS-700 server.
- **Syntax :**  
WORD Get\_PDS\_Server\_Network\_Info(pds\_mod\_t \*PDSMod);
- **Parameter :**  
PDSMod: [input] A structure pointer. None.
- **Return:**  
Return 0 means success, others means failure (Please refer to "Section

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1.1 Error Code").

---

### 1.3.12 Reset\_PDS\_Module

- **Description :**  
To restart the PDS/tDS-700 server.
  - **Syntax :**  
WORD Reset\_PDS\_Module(pds\_mod\_t \*PDSMod);
  - **Parameter :**  
PDSMod: [input] A structure pointer.None.
  - **Return:**  
Return 0 means success, others means failure (Please refer to "Section 1.1 Error Code").
- 

### 1.3.13 Set\_PDS\_Server\_IP

- **Description :**  
To configure the IP address of PDS/tDS-700 server.
  - **Syntax :**  
WORD Set\_PDS\_Server\_IP(pds\_mod\_t \*PDSMod, char \*NewServerIP);
  - **Parameter :**  
PDSMod: [input] A structure pointer.  
NewServerIP: [input] The new IP address of PDS/tDS-700 server.
  - **Return:**  
Return 0 means success, others means failure (Please refer to "Section 1.1 Error Code").
- 

### 1.3.14 Set\_PDS\_Server\_Gateway

- **Description :**  
To configure the new gateway of PDS/tDS-700 server.
- **Syntax :**  
WORD Set\_PDS\_Server\_Gateway(pds\_mod\_t \*PDSMod, char \*NewServerGateway);
- **Parameter :**  
PDSMod: [input] A structure pointer.  
NewServerGateway: [input] The new gateway of PDS/tDS-700 server.
- **Return:**  
Return 0 means success, others means failure (Please refer to "Section

---

1.1 Error Code").

---

### 1.3.15 Set\_PDS\_Server\_SubMask

- **Description :**  
To configure the new sub-network mask of PDS/tDS-700 server.
  - **Syntax :**  
WORD Set\_PDS\_Server\_SubMask(pds\_mod\_t \*PDSMod, char \*NewServerSubMask);
  - **Parameter :**  
PDSMod: [input] A structure pointer.  
NewServerSubMask: [input] The new submask of PDS/tDS-700 server.
  - **Return:**  
Return 0 means success, others means failure (Please refer to "Section 1.1 Error Code").
- 

### 1.3.16 Send\_Read\_String

- **Description :**  
To send and receive string from PDS/tDS-700 server.
  - **Syntax :**  
WORD Send\_Read\_String(pds\_mod\_t \*PDSMod, WORD ServerCOM, char Out\_String[], char In\_String[]);
  - **Parameter :**  
PDSMod: [input] A structure pointer.  
ServerCOM: [input] The COM port number of PDS/tDS-700 server.  
Out\_String: [input] The sending string.  
In\_String: [Output] Receiving the response string from the modules.
  - **Return:**  
Return 0 means success, others means failure (Please refer to "Section 1.1 Error Code").
- 

### 1.3.17 Send\_String

- **Description :**  
To send string from the COM port of PDS/tDS-700 server.
- **Syntax :**  
WORD Send\_String(pds\_mod\_t \*PDSMod, WORD ServerCOM, char Out\_String[]);

- 
- **Parameter :**  
PDSMod: [input] A structure pointer.  
ServerCOM: [input] The COM port number of PDS/tDS-700 server.  
Out\_String: [input] The sending string.
  - **Return:**  
Return 0 means success, others means failure (Please refer to "Section 1.1 Error Code").
- 

### 1.3.18 Read\_String

- **Description :**  
To receive from the COM port of PDS/tDS-700 server.
  - **Syntax :**  
WORD Read\_String(pds\_mod\_t \*PDSMod, WORD ServerCOM, char In\_String[]);
  - **Parameter :**  
PDSMod: [input] A structure pointer.  
ServerCOM: [input] The COM port number of PDS/tDS-700 server.  
In\_String: [output] The receiving string from the PDS/tDS-700 server.
  - **Return:**  
Return 0 means success, others means failure (Please refer to "Section 1.1 Error Code").
- 

### 1.3.19 Send\_Modbus

- **Description :**  
To send Modbus protocol from the COM port of PSD-700 server.
- **Syntax :**  
WORD Send\_Modbus(pds\_mod\_t \*PDSMod, WORD ServerCOM, char Out\_String[], char Out\_len);
- **Parameter :**  
PDSMod: [input] A structure pointer.  
ServerCOM: [input] The COM port number of PDS/tDS-700 server.  
Out\_String: [input] The sending string.  
Out\_len:[input] The "Out\_String " string length.
- **Return:**  
Return 0 means success, others means failure (Please refer to "Section 1.1 Error Code").

---

### 1.3.20 Read\_Modbus

- **Description :**  
To receive Modbus protocol from the COM port of PDS/tDS-700 server.
- **Syntax :**  
WORD Read\_Modbus(pds\_mod\_t \*PDSMod, WORD ServerCOM, char In\_String[], char In\_len);
- **Parameter :**  
PDSMod: [input] A structure pointer.  
ServerCOM: [input] The COM port number of PDS/tDS-700 server.  
In\_String: [output] The receiving string from the PDS/tDS-700 server.  
In\_len:[input] The "In\_String" string length.
- **Return:**  
Return 0 means success, others means failure (Please refer to "Section 1.1 Error Code").

---

### 1.3.21 Send\_Binary

- **Description :**  
To send raw data to the COM port of PDS/tDS-700 server.
- **Syntax :**  
WORD Send\_Binary(pds\_mod\_t \*PDSMod, WORD ServerCOM, char Out\_String[], int len);
- **Parameter :**  
PDSMod: [input] A structure pointer.  
ServerCOM: [input] The COM port number of PDS/tDS-700 server.  
Out\_String: [output] The sending string.  
In\_len:[input] The "Out\_String" string length.
- **Return:**  
Return 0 means success, others means failure (Please refer to "Section 1.1 Error Code").

---

### 1.3.22 Read\_Binary

- **Description :**  
To receive raw data from the COM port of PDS/tDS-700 server.
- **Syntax :**  
WORD Read\_Binary(pds\_mod\_t \*PDSMod, WORD ServerCOM, char

---

In\_String[], int len);

- **Parameter :**  
PDSMod: [input] A structure pointer.  
ServerCOM: [input] The COM port number of PDS/tDS-700 server.  
In\_String: [output] The receiving string from the PDS/tDS-700 server.  
In\_len:[input] The "In\_String" string length.
- **Return:**  
Return 0 means success, others means failure (Please refer to "Section 1.1 Error Code").

---

### 1.3.23 Send\_CAN\_Msg

- **Description :**  
To send CAN message from the CAN port of remote server.
- **Syntax :**  
WORD Send\_CAN\_Msg(pds\_mod\_t \*PDSMod, char\* can\_msg)
- **Parameter :**  
PDSMod: [input] A structure pointer.  
can\_msg: [output] Send CAN message to remote server.
- **Return:**  
Return 0 means success, others means failure (Please refer to "Section 1.1 Error Code").

---

### 1.3.24 Read\_CAN\_Msg

- **Description :**  
To receive raw data from the COM port of PDS/tDS-700 server.
- **Syntax :**  
WORD Read\_CAN\_Msg(pds\_mod\_t \*PDSMod, char \*In\_String)
- **Parameter :**  
PDSMod: [input] A structure pointer.  
In\_String: [output] The receiving string from the remote server.
- **Return:**  
Return 0 means success, others means failure (Please refer to "Section 1.1 Error Code").



## 2. PDS/tDS-700 Library Demo For Linux

The PDS/tDS-700 library package provided the demo code in the package directory “examples” (Please refer to Table 2.1).

Table 2.1

Directory Path	File Name	Description
include	pds700.h	The header of PDS/tDS-700 library.
lib	libpds700.a	The PDS/tDS-700 library for x86 Linux PC.
	libpds700_64.a	The PDS/tDS-700 library for x64 Linux PC.
doc	PDS700-Linux-Manual.pdf	The linux manual for PDS/tDS-700 library.
examples	pds_info.c	Show PDS/tDS-700 server information.
	pds_send_read.c pds_send_read2.c	Sending and Receiving string from PDS/tDS-700 server.
	pds_send_read_modbus.c	Sending and Receiving Modbus protocol from PDS/tDS-700 server.
	pds_send_read_binary.c	Sending and Receiving raw data from PDS/tDS-700 server.
	pds_set_net	Reset the network configuration of PDS/tDS-700 server.
	pds_send_can	Send CAN message to remote server.
	pds_read_can	Receive CAN message from remote server.
	eSearch	Get current subnet pds/tds modules information (IP, Submask, Gateway, MAC address)

---

## 2.1 Demo code “pds\_info”

This demo program would show the information of PDS/tDS-700 server. Please refer to figure 2-1

```
[root@localhost examples]# ./pds_info 10.1.0.46
Minios7 Version      : v2.2.24[Apr 19 2010]
Vxcomm.exe Version  : v3.2.32[Jul 14 2010]
PDS Server IP       : 10.1.0.46
PDS Server MAC      : 00:0d:e0:50:00:95
PDS Server Gateway  : 10.1.0.254
PDS Server Submask  : 255.255.0.0
PDS Server COM1    : 115200,8,0,1
PDS Server COM2    : 38400,8,0,1
PDS Server COM3    : 9600,8,0,1
PDS Server COM4    : 115200,8,0,1
PDS Server COM5    : 38400,8,0,1
PDS Server COM6    : 9600,8,0,1
PDS Server COM7    : 115200,8,0,1
PDS Server COM8    : 38400,8,0,1
```

Figure 2-1

---

## 2.2 Demo code “pds\_send\_read”

This “pds\_send\_read” and “pds\_send\_read2” demo program would send and receive string from the COM port 1 of PDS/tDS-700 server. Please refer to figure 2-2.

```
[root@localhost examples]# ./pds_send_read 10.1.0.46 1 115200
Send String to PDS COM1 : testmsg
Read String from PDS COM1 : testmsg
[root@localhost examples]# ./pds_send_read2 10.1.0.46 1 115200
Send String to PDS COM1 : testmsg
Read string from PDS COM1 : testmsg
[root@localhost examples]#
```

Figure 2-2

### 2.3 Demo code “pds\_send\_read\_modbus”

This demo program would send and receive modbus protocol from the COM port 1 of PDS/tDS-700 server. Please refer to figure 2-3.

```
[root@localhost examples]# ./pds_send_read_modbus 10.1.0.17 1 115200
Send modbus to PDS COM1 :
send_cmd[0] 0x1      NetID
send_cmd[1] 0x3      Function code
send_cmd[2] 0x1      Modbus address high byte
send_cmd[3] 0xe2     Modbus address low byte
send_cmd[4] 0x0      Channel number high byte
send_cmd[5] 0x2      Channel number low byte
send_cmd[6] 0x65     CRC
send_cmd[7] 0xc1     CRC
Read modbus from PDS COM1 :
receive_cmd[0] 0x1      NetID
receive_cmd[1] 0x3      Function code
receive_cmd[2] 0x4      Byte count
receive_cmd[3] 0x17     Data Hi (address 482)
receive_cmd[4] 0x0      Data Low (address 482)
receive_cmd[5] 0x0      Data Hi (address 483)
receive_cmd[6] 0x70     Data Low (address 483)
receive_cmd[7] 0xfe     CRC
receive_cmd[8] 0x63     CRC
```

Figure 2-3

### 2.4 Demo code “pds\_send\_read\_binary”

This demo program would send and receive raw data from the COM port 1 of PDS-tDS-700 server. Please refer to figure 2-4.

```
[root@localhost examples]# ./pds_send_read_binary 10.1.0.58 1
Send Binary to PDS COM1 : 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
Read Binary from PDS COM1 : 0 1 2 3 4 5 6 7 8 9
Read Binary from PDS COM1 : 10 11 12 13 14 15 16 17 18 19
```

Figure 2-4

---

## 2.5 Demo code “pds\_set\_net”

This demo program would reset the network configuration of PDS/tDS-700 server. Please refer to figure 2-5

```
[root@localhost examples]# ./pds_set_net 10.1.0.46
PDS Server IP      : 10.1.0.46
PDS Server MAC     : 00:0d:e0:50:00:95
PDS Server Gateway : 10.1.0.254
PDS Server Submask : 255.255.0.0
The old network configuration

PDS Server IP      : 10.1.0.25
PDS Server MAC     : 00:0d:e0:50:00:95
PDS Server Gateway : 10.1.0.254
PDS Server Submask : 255.255.0.0
The new network configuration
```

Figure 2-5

## 2.6 Demo code “pds\_send\_can”

This demo program have to set IP & baud rate first, you can set above two parameter in Windows, refer to

[ftp://ftp.icpdas.com/pub/cd/fieldbus\\_cd/can/converter/i-7540d/manual/](ftp://ftp.icpdas.com/pub/cd/fieldbus_cd/can/converter/i-7540d/manual/)

And use I-7540D Utility.

```
root@icpdas:~/pds700_lib/examples# ./pds_send_can 10.1.0.101 001 2 11 22
Example: ./pds_send_can 10.1.0.1 03f 8 01 03 05 07 09 0b 0d 0f
message you send "t00121122" → CAN message you send
root@icpdas:~/golden/pds700_lib/examples#
```

## 2.7 Demo code “pds\_read\_can”

This demo program have to set IP & baud rate first, you can set above two parameter in Windows, refer to

[ftp://ftp.icpdas.com/pub/cd/fieldbus\\_cd/can/converter/i-7540d/manual/](ftp://ftp.icpdas.com/pub/cd/fieldbus_cd/can/converter/i-7540d/manual/)

And use I-7540D Utility.

```
root@icpdas:~/pds700_lib/examples# ./pds_read_can 10.1.0.101
"Ctrl + c" to exit.
Read string from PDS : t12381122334455667788
ID  DLC  DATA
123 8    1122334455667788          Receive CAN message
```

---

## 2.8 Demo code “eSearch”

This demo program shows modules information (IP, submask, gateway) in your sub-netmask

```
root@winson:~/pds700_lib/examples# ./eSearch
List modules in submask
NAME=tDS-715_RevB
IP=10.1.0.9      MASK=255.255.0.0    GATEWAY=10.1.0.254  MAC=00:0d:e0:12:34:56
NAME=PDS-782
IP=10.1.102.235 MASK=255.255.0.0    GATEWAY=10.1.0.254  MAC=00:0d:e0:50:02:9e
NAME=PDS-782
IP=10.1.102.234 MASK=255.255.0.0    GATEWAY=10.1.0.254  MAC=00:0d:e0:50:02:ba
```