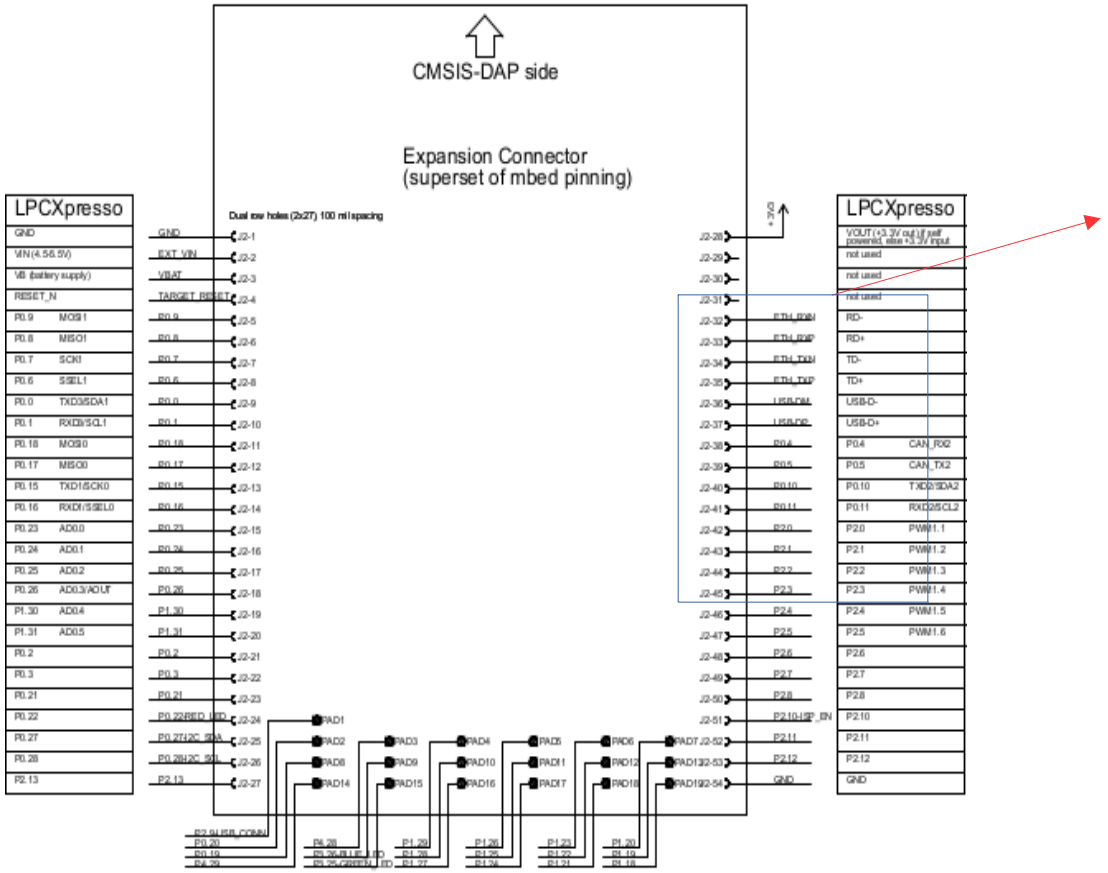
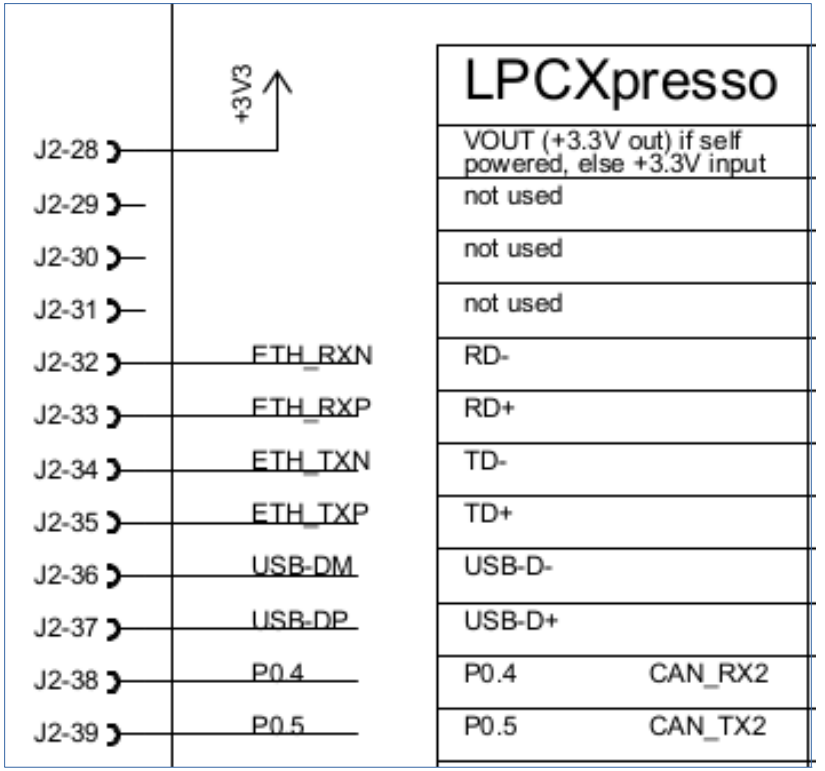
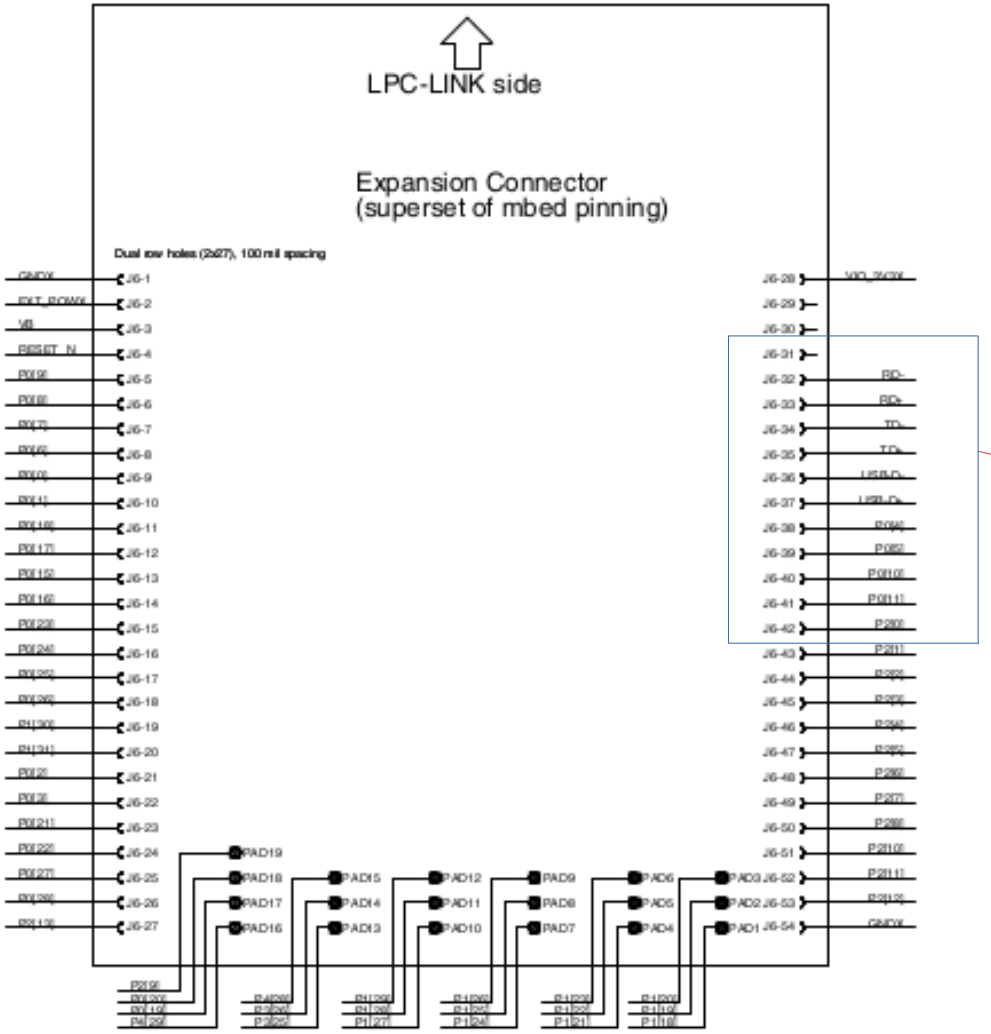
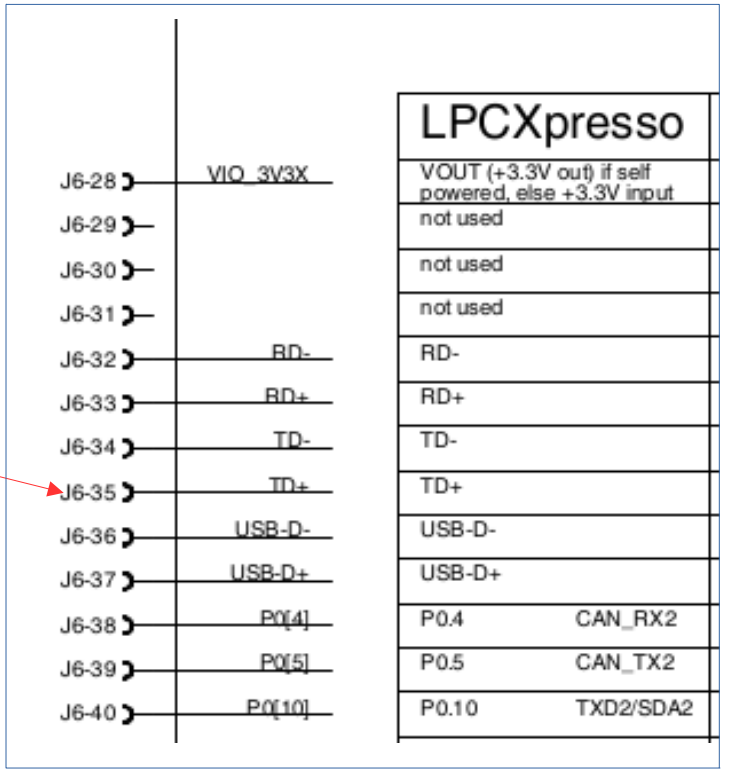
2019-2-1 LPC1769 Rev D Ethernet Pins





2019-2-1 LPC1769 Rev B Ethernet Pins





Same pin numbers except the connector name is J6, later in Rev D, the connector name is changed from J6 J2

Ethernet Pins on LPC1769

From LPCXpresso1769_CD_revD(1)

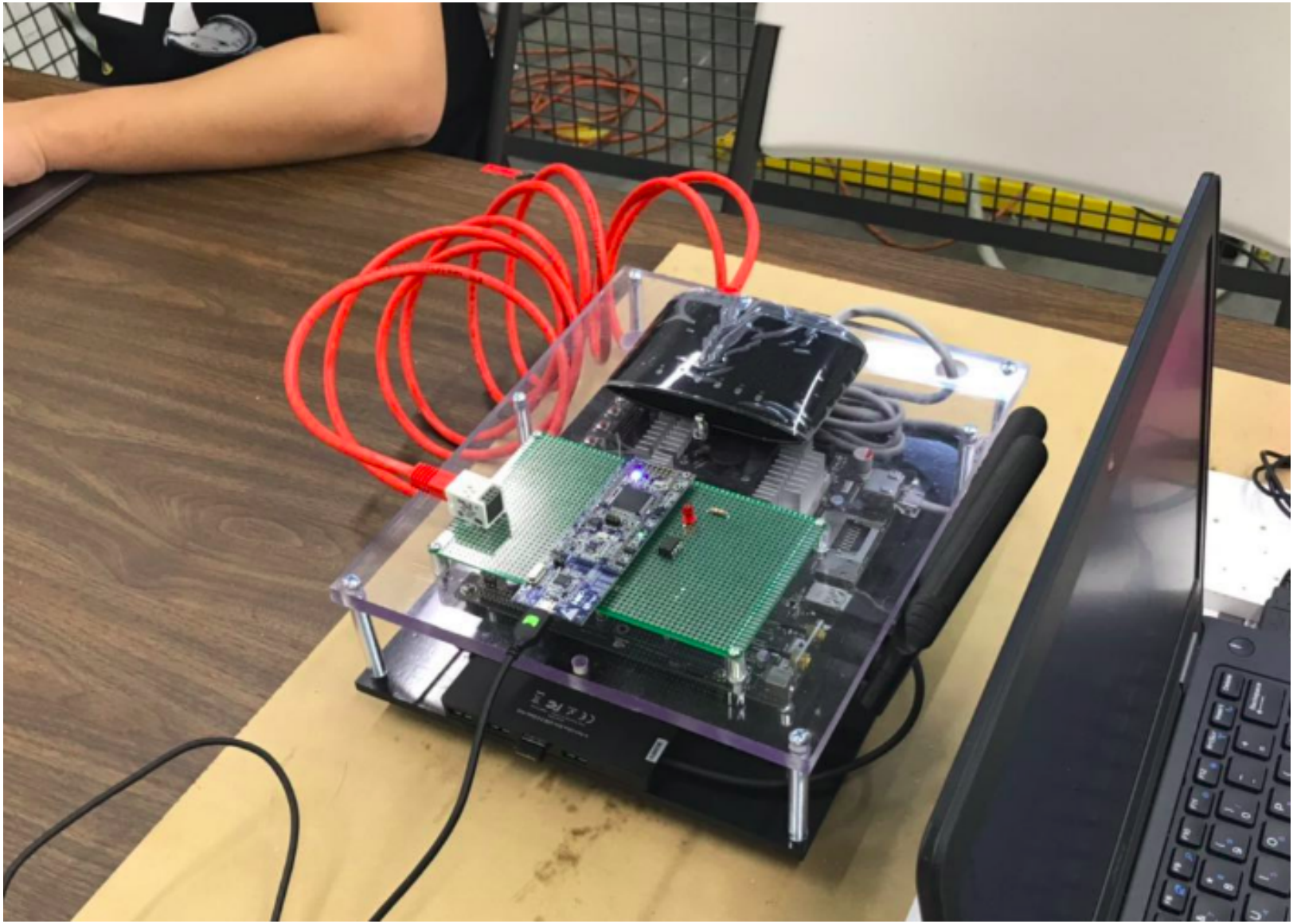
J2-31		not used	IF-
J2-32	ETH_RXN	RD-	RD- (Ethernet)
J2-33	ETH_RXP	RD+	RD+ (Ethernet)
J2-34	ETH_TXN	TD-	TD- (Ethernet)
J2-35	ETH_TXP	TD+	TD+ (Ethernet)
J2-36	USB-DM	USB-D-	D- (USB)

From CPU Datasheet 8.5.3 Pin Function Select register 2 (PINSEL2 - 0x4002 C008)

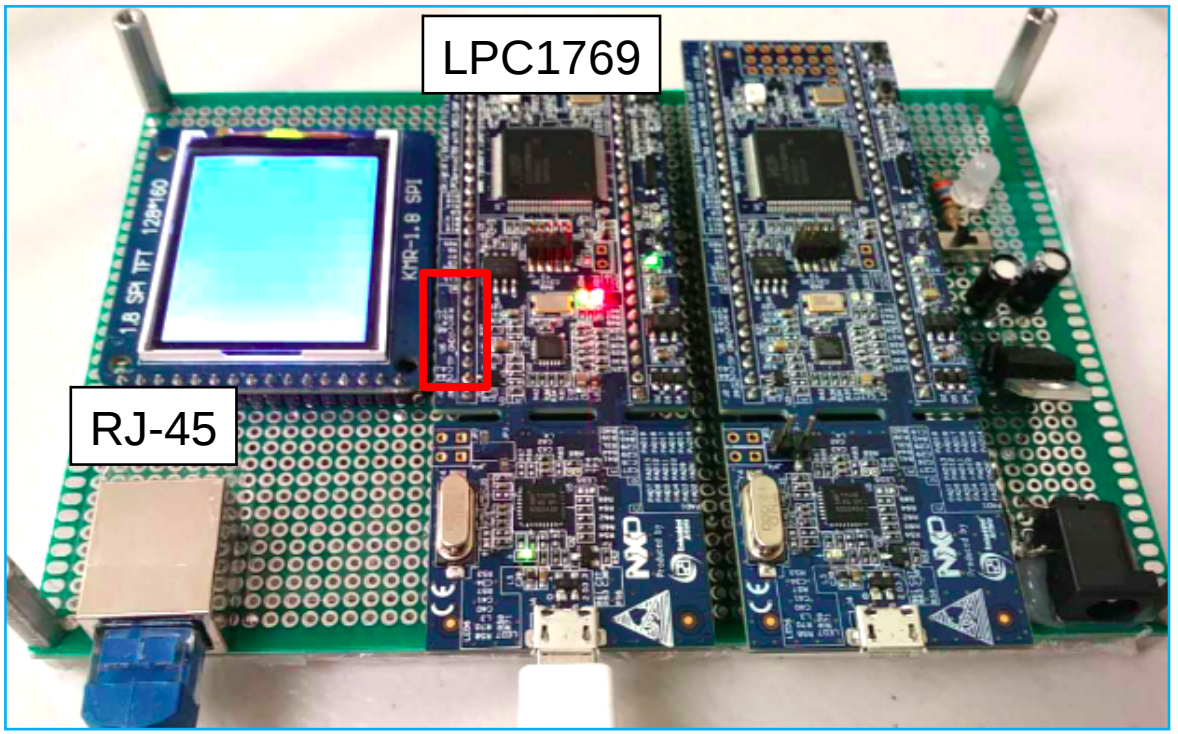
Table 82. Pin function select register 2 (PINSEL2 -

PINSEL2	Pin name	Function when 00	Function when 01
1:0	P1.0	GPIO Port 1.0	ENET_TXD0
3:2	P1.1	GPIO Port 1.1	ENET_TXD1
7:4	-	Reserved	Reserved
9:8	P1.4	GPIO Port 1.4	ENET_TX_EN
17:16	P1.8	GPIO Port 1.8	ENET_CRS
19:18	P1.9	GPIO Port 1.9	ENET_RXD0
21:20	P1.10	GPIO Port 1.10	ENET_RXD1
27:22	-	Reserved	Reserved
29:28	P1.14	GPIO Port 1.14	ENET_RX_ER
31:30	P1.15	GPIO Port 1.15	ENET_REF_CLK

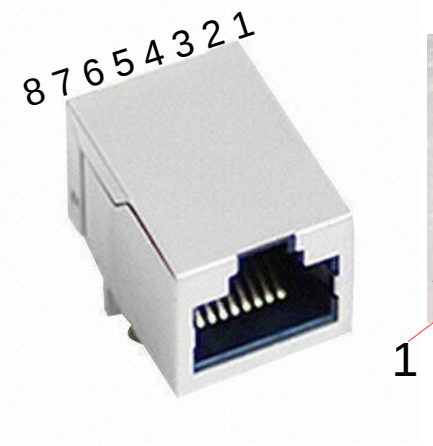
Ethernet on LPCNOD



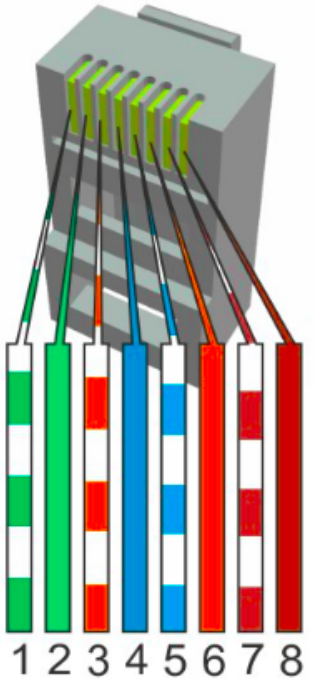
Ethernet Hardware Connection



RJ-45 Header

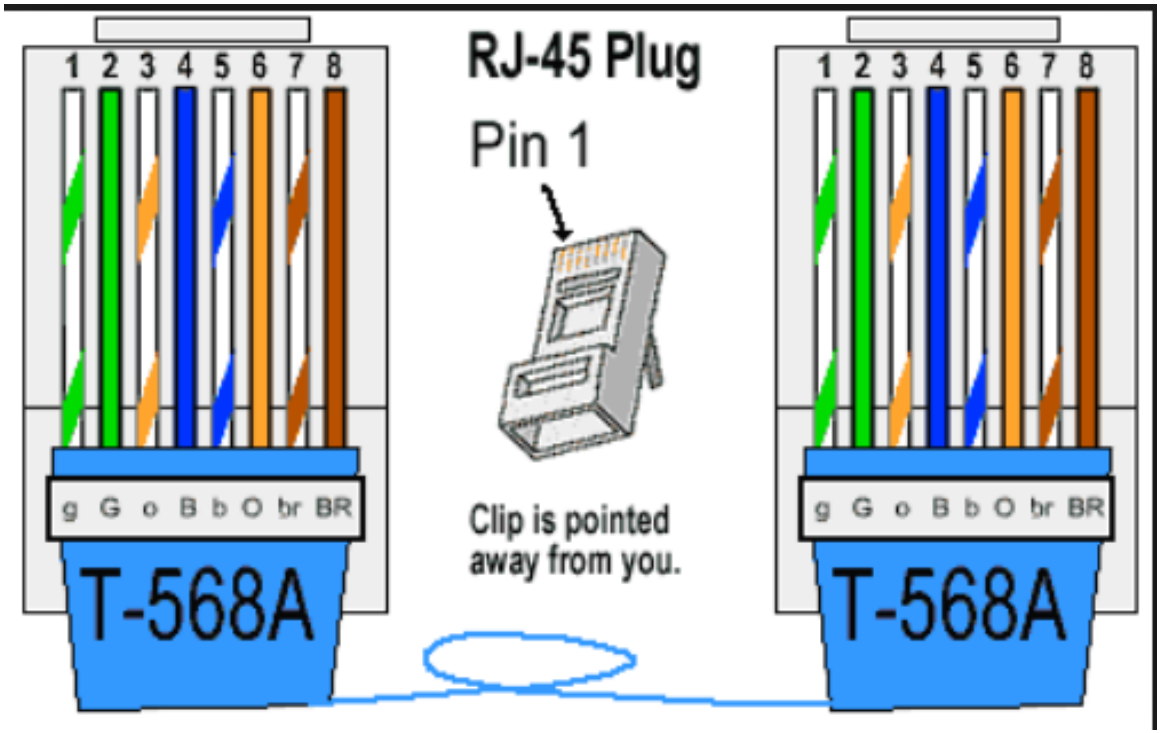


LPC1769 Module	RJ-45 Jack		
Pin	Definition	Pin	Definition
J2_32	ETH_RXN	6	RX-
J2_33	ETH_RXP	3	RX+
J2_34	ETH_TXN	2	TX-
J2_35	ETH_TXP	1	TX+

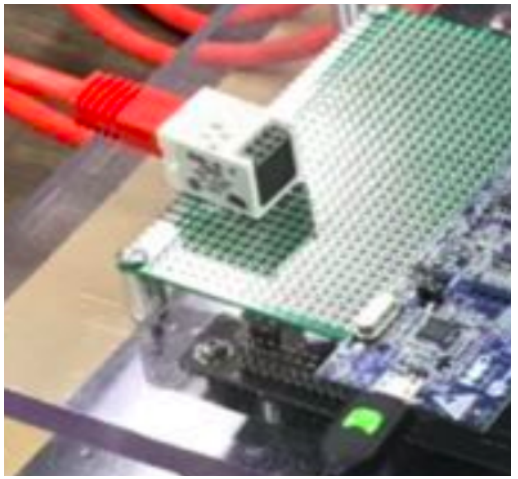


CAT5 Cable

Ethernet Cable & Connector



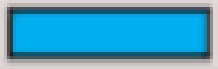
https://www.google.com/search?q=ethernet+cable+color+code&client=ubuntu&hs=2Sb&channel=fs&tbm=isch&source=iu&ictx=1&fir=obOn9NSdzowdVM%253A%252CV-i5CBR7Nb_OJM%252C_&vet=1&usg=AI4_-kS6wnAZY4nefNMLd34ReOb3RHCq1A&sa=X&ved=2ahUKEwjeo7Okh8HhAhWxOH0KHRkQBvoQ9QEwAHoECA0QBg#imgrc=obOn9NSdzowdVM:



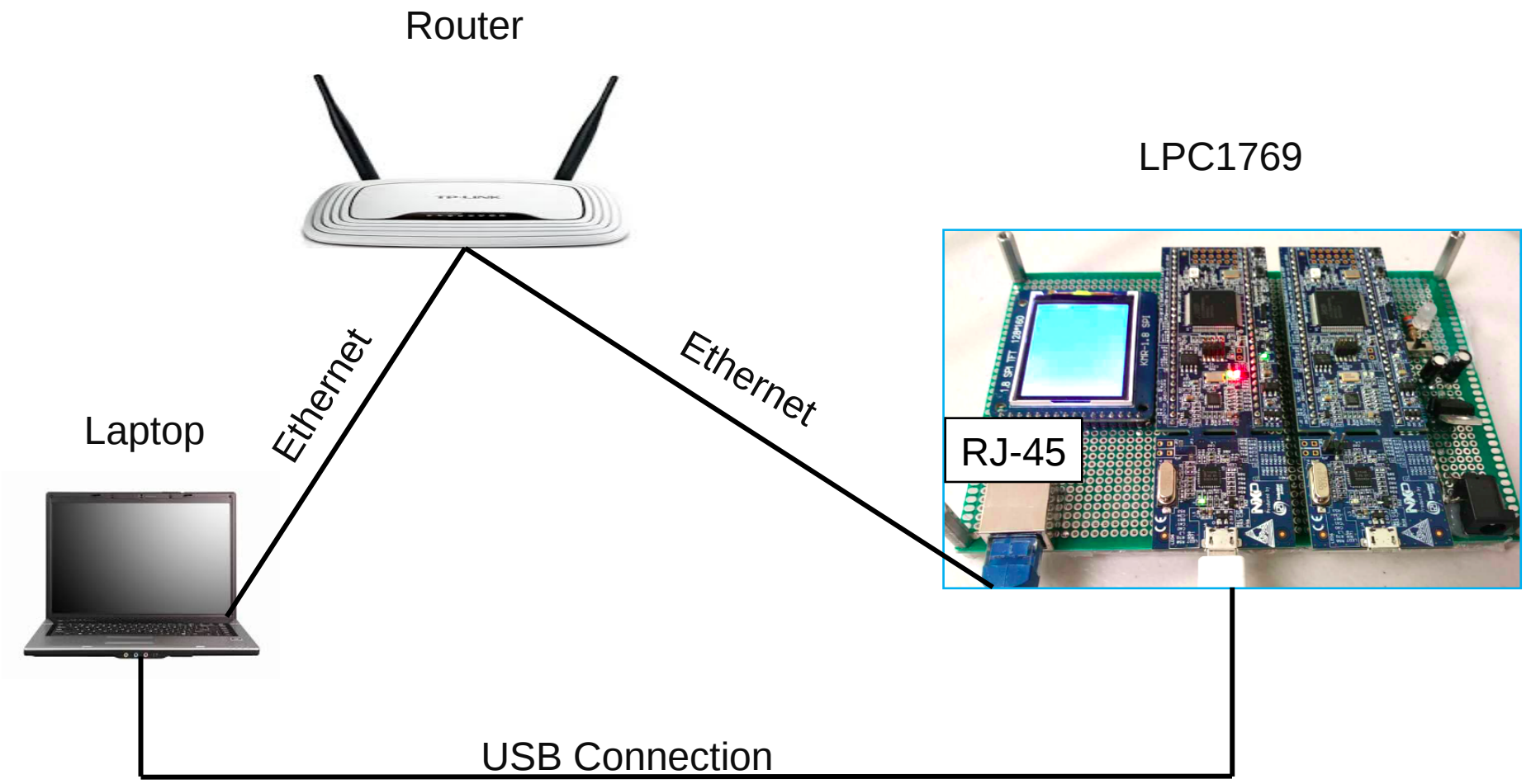
Right angle connector with shield

10PCS/LOT Ethernet RJ45 Jack Shielded Network Socket Connector PCB Mounting 8P8C 21MM
https://www.aliexpress.com/item/30PCS-LOT-RJ45-shielded-connector-network-jack-socket-8Pins-long-style/32529983630.html

April-8-2019 Ethernet on LPCNOD

Cat5e Wire Diagram for T568B (Straight Through Cable)				
RJ45 Pin #	Wire Color (T568A)	Wire Diagram (T568A)	10Base-T Signal 100Base-TX Signal	1000Base-T Signal
1	White/Orange		Transmit+	Bi_DA+
2	Orange		Transmit-	Bi_DA-
3	White/Green		Receive+	Bi_DB+
4	Blue		Unused	Bi_DC+
5	White/Blue		Unused	Bi_DC-
6	Green		Receive-	Bi_DB-
7	White/Brown		Unused	Bi_DD+
8	Brown		Unused	Bi_DD-

System Connection Diagram



Software Setup

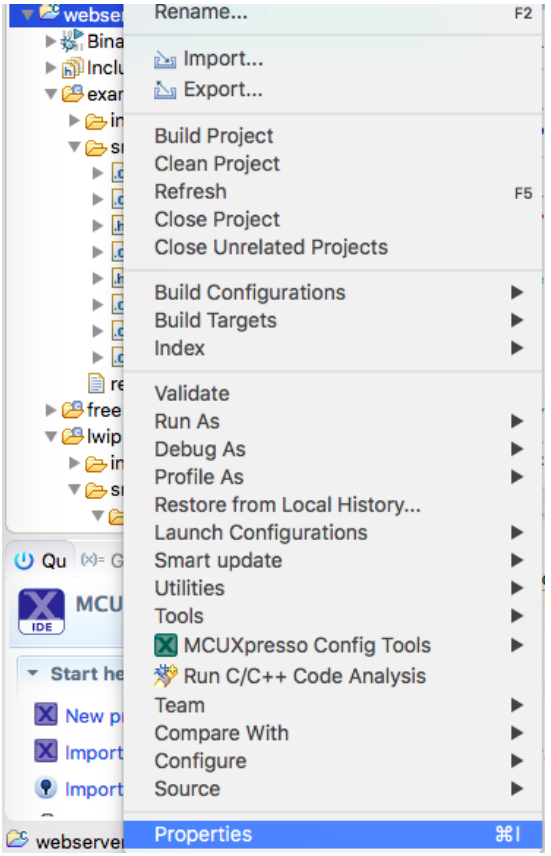
- Environment: MCUExpresso IDE v10.1.1 [Build 606]
- Test code: LPCOpen “webserver” example
- Varialbe “LWIP_DHCP” in “lwipopts.h” decide to use DHCP or manual setup IP Address

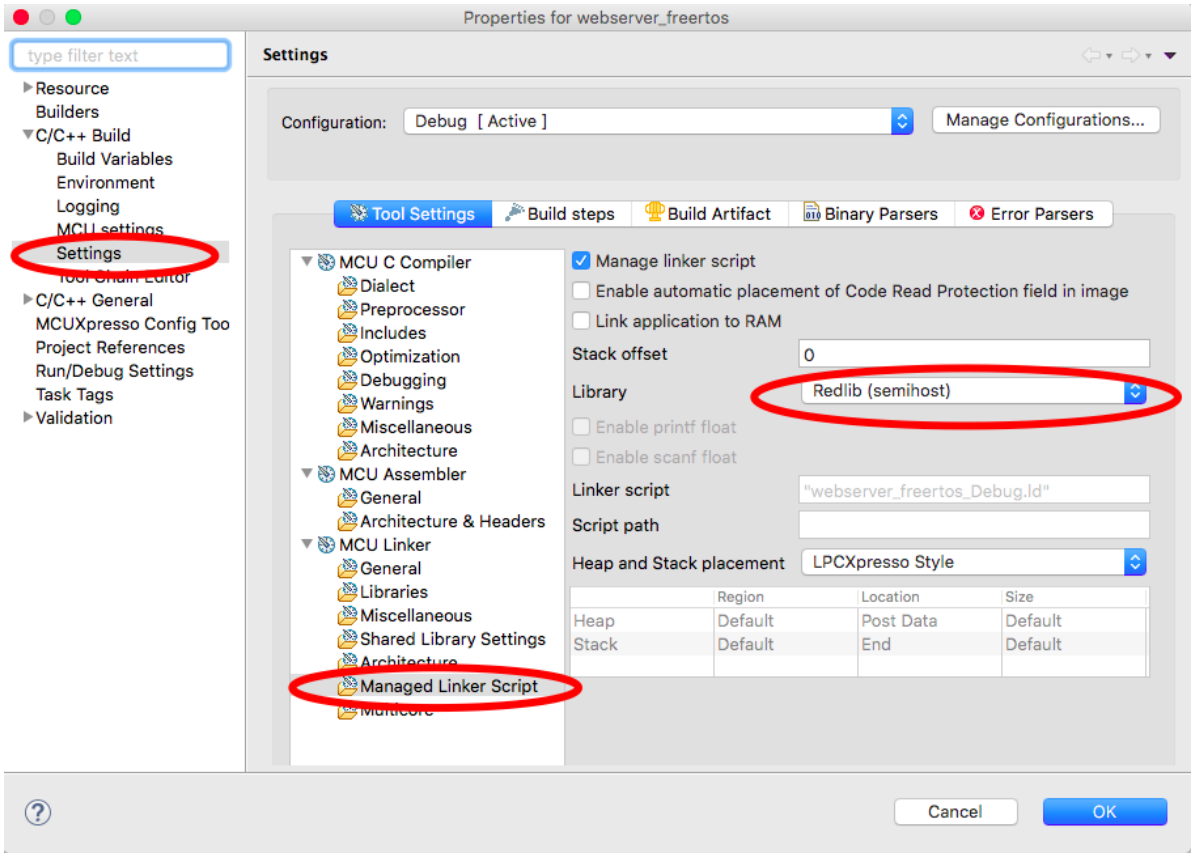
```
114     /* Static IP assignment */
115 #if LWIP_DHCP
116     IP4_ADDR(&gw, 0, 0, 0, 0);
117     IP4_ADDR(&ipaddr, 0, 0, 0, 0);
118     IP4_ADDR(&netmask, 0, 0, 0, 0);
119 #else
120     IP4_ADDR(&gw, 192, 168, 0, 1);
121     IP4_ADDR(&ipaddr, 192, 168, 0, 3);
122     IP4_ADDR(&netmask, 255, 255, 255, 0);
123     printf(&ipaddr);
124 #endif
```

- LPC1769 IP setting: IP 192.168.0.3, GW 192.168.0.1, Mask 255.255.255.0
- PC IP setting: IP 192.168.0.1, Mask 255.255.255.0

Software Setup (Optional for Debug)

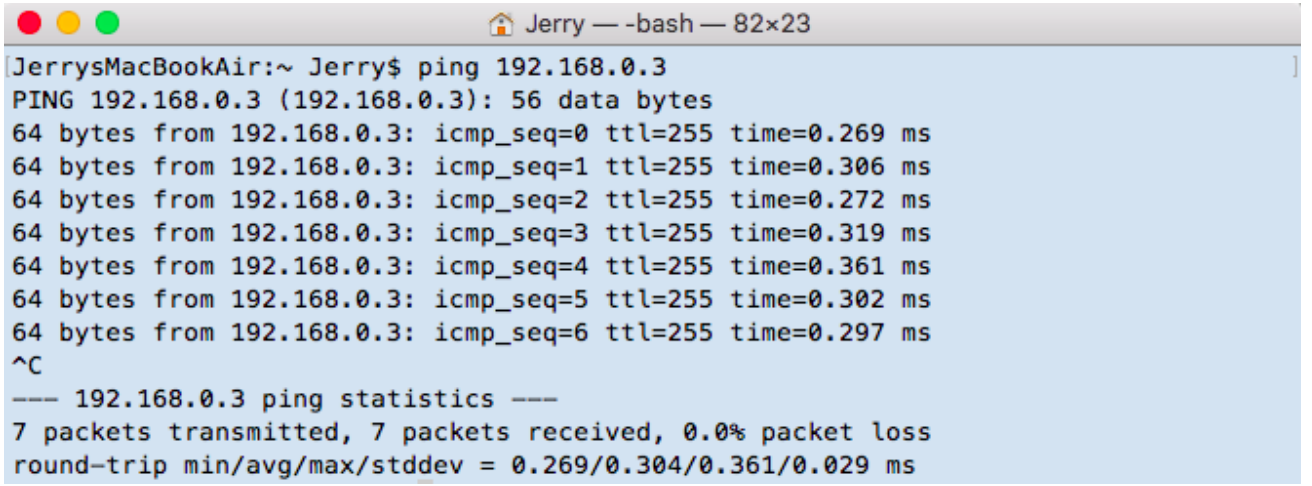
- If like to print debug information on MCUExpresso console:
  1.Right click on project name -> properties
  2.Changed to Redlib (semihost)
- Otherwise, keep as Redlib (nohost)





Testing and Verification

- PC: ping 192.168.0.3 successfully



- Use Netcat (NC) to test the IP and port:

```
JerrysMacBookAir:~ Jerry$ nc -vvv 192.168.0.3 6001
found 0 associations
found 1 connections:
     1: flags=82<CONNECTED,PREFERRED>
        outif en3
        src 192.168.0.1 port 52235
        dst 192.168.0.3 port 6001
        rank info not available
        TCP aux info available

Connection to 192.168.0.3 port 6001 [tcp/*] succeeded!
```

Ethernet 6 Step Configuration

CPU Datasheet Chapter 10: LPC176x/5x Ethernet

1. Power: In the PCONP register (Table 46), set bit PCENET.

   Remark: On reset, the Ethernet block is disabled (PCENET = 0).
2. Clock: see Table 38.
3. Pins: Enable Ethernet pins through the PINSEL registers and select their modes through the PINMODE registers, see Section 8.5.
4. Wake-up: Activity on the Ethernet port can wake up the microcontroller from Power-down mode, see Section 4.8.8.
5. Interrupts: Interrupts are enabled in the NVIC using the appropriate Interrupt Set Enable register.
6. Initialization: see Section 10.17.2.

Program Overview