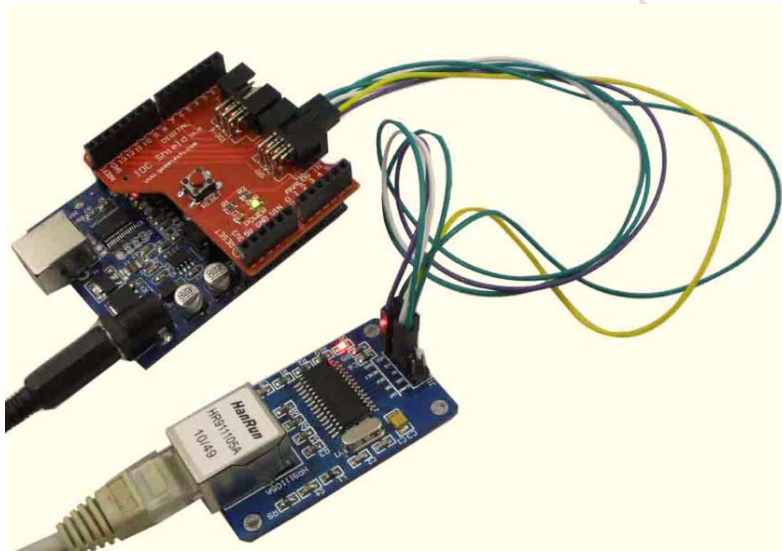


## ENC28J60 Net Module makes your AVR online

Besides [W5100](#), [ENC28J60](#) is another widely used network chip, the early Arduino network module is accomplished by means of ENC28J60, although later a new Arduino network module come up based on [W5100](#), but the [ENC28J60](#) is also widely used due to its stable and reliable...features. The product in this post is about the previous [ENC28J60 Version Arduino network module](#), some of our readers and customers mailed us asking how to connect this module to the Arduino UNO/MEGA board, from this post you will get some tips and test demo code to make your arduino be online.



Connect your ENC28J60 network module to arduino board according to the following diagram, you can also use a [Arduino IDC-6/SPI Shield](#) for your convenience, to upload you need to click and download the ENC28J60 Ethernet library.

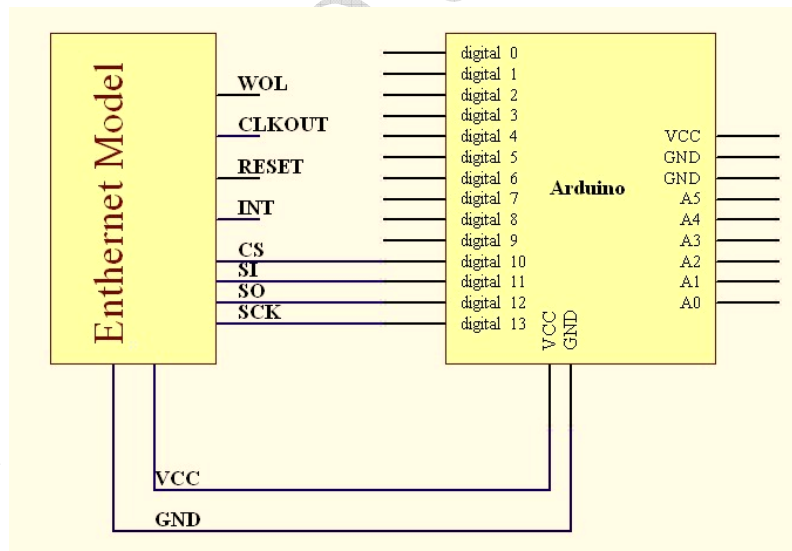
After doing this, you are almost finish this easy task, go ahead verify and program your sketch, open your browser input the IP address you set in the sketch, then Enter it, you will see your arduino board is online.

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You can also use these modules with the [Temperature Sensor](#) and [Humidity Sensor](#) to show the temperature and the humidity online.



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## Demo code:

```
#include "EncEthernet.h"

// change MAC and IP address if necessary
static uint8_t mymac[6] = {0x54,0x55,0x58,0x10,0x00,0x24};
static uint8_t myip[4] = {192,168,0,88};
static char baseurl[]="http://192.168.0.88/";
static uint16_t mywwwport =80;

#define BUFFER_SIZE 500
static uint8_t buf[BUFFER_SIZE+1];
#define STR_BUFFER_SIZE 22
static char strbuf[STR_BUFFER_SIZE+1];

EncEthernet es = EncEthernet();

// prepare the webpage by writing the data to the tcp send buffer
uint16_t print_webpage(uint8_t *buf);
int8_t analyse_cmd(char *str);
void setup(){

    /*initialize enc28j60*/
    es.E_enc28j60Init(mymac);
    es.E_enc28j60clkout(2); // change clkout from 6.25MHz to 12.5MHz
    delay(10);

    /* Magjack leds configuration, see enc28j60 datasheet, page 11 */
    // LEDA=greed LEDB=yellow

    // 0x880 is PHLCON LEDB=on, LEDA=on
    // enc28j60PhyWrite(PHLCON,0b0000 1000 1000 00 00);
    es.E_enc28j60PhyWrite(PHLCON,0x880);
    delay(500);

    // 0x990 is PHLCON LEDB=off, LEDA=off
    // enc28j60PhyWrite(PHLCON,0b0000 1001 1001 00 00);
    es.E_enc28j60PhyWrite(PHLCON,0x990);
    delay(500);
```

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```
// 0x880 is PHLCON LEDB=on, LEDA=on
// enc28j60PhyWrite(PHLCON,0b0000 1000 1000 00 00);
es.E_enc28j60PhyWrite(PHLCON,0x880);
delay(500);

// 0x990 is PHLCON LEDB=off, LEDA=off
// enc28j60PhyWrite(PHLCON,0b0000 1001 1001 00 00);
es.E_enc28j60PhyWrite(PHLCON,0x990);
delay(500);

// 0x476 is PHLCON LEDA=links status, LEDB=receive/transmit
// enc28j60PhyWrite(PHLCON,0b0000 0100 0111 01 10);
es.E_enc28j60PhyWrite(PHLCON,0x476);
delay(100);

//init the ethernet/ip layer:
es.E_init_ip_arp_udp_tcp(mymac,myip,80);
}

void loop(){
  uint16_t plen, dat_p;
  int8_t cmd;

  plen = es.E_enc28j60PacketReceive(BUFFER_SIZE, buf);
  // plen will ne unequal to zero if there is a valid packet
  if(plen!=0){
    // arp is broadcast if unknown but a host may also verify
    // the mac address by sending it to a unicast address.
    if(es.E_eth_type_is_arp_and_my_ip(buf,plen)){
      es.E_make_arp_answer_from_request(buf);
      return;
    }

    // check if ip packets are for us:
    if(es.E_eth_type_is_ip_and_my_ip(buf,plen)==0){
      return;
    }

    if(buf[IP_PROTO_P]==IP_PROTO_ICMP_V
      && buf[ICMP_TYPE_P]==ICMP_TYPE_ECHOREQUEST_V){
```

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```
es.E_make_echo_reply_from_request(buf,plen);
return;
}

// tcp port www start, compare only the lower byte
if (buf[IP_PROTO_P]==IP_PROTO_TCP_V
    && buf[TCP_DST_PORT_H_P]== 0
    && buf[TCP_DST_PORT_L_P]== mywwwport){
    if (buf[TCP_FLAGS_P] & TCP_FLAGS_SYN_V){
        // make_tcp_synack_from_syn does already send the syn,ack
        es.E_make_tcp_synack_from_syn(buf);
        return;
    }
    if (buf[TCP_FLAGS_P] & TCP_FLAGS_ACK_V){
        es.E_init_len_info(buf); // init some data structures
        dat_p=es.E_get_tcp_data_pointer();
        if (dat_p==0){ // we can possibly have no data, just ack:
            if (buf[TCP_FLAGS_P] & TCP_FLAGS_FIN_V){
                es.E_make_tcp_ack_from_any(buf);
            }
            return;
        }
        if (strncmp("GET ",(char *)&(buf[dat_p]),4)!=0){
            // head, post and other methods for possible status codes
            // http://www.w3.org/Protocols/rfc2616/rfc2616-sec10.html
            plen=es.E_fill_tcp_data_p(buf, 0, PSTR("HTTP/1.0 200 OK\r\nContent-Type: text/html\r\n\r\n<h1>200
OK</h1>"));
            goto SENDTCP;
        }
        if (strncmp("/ ",(char *)&(buf[dat_p+4]),2)==0){
            plen=print_webpage(buf);
            goto SENDTCP;
        }
        cmd=analyse_cmd((char *)&(buf[dat_p+5]));
        if (cmd==1){
            plen=print_webpage(buf);
        }
        // send ack for http get
        SENDTCP: es.E_make_tcp_ack_from_any(buf);
        // send data
```

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```
        es.E_make_tcp_ack_with_data(buf,plen);
    }
}
}
}
// The returned value is stored in the global var strbuf
uint8_t find_key_val(char *str,char *key)
{
    uint8_t found=0;
    uint8_t i=0;
    char *kp;
    kp=key;
    while(*str && *str!=' ' && found==0){
        if (*str == *kp){
            kp++;
            if (*kp == '\0'){
                str++;
                kp=key;
                if (*str == '='){
                    found=1;
                }
            }
        }
        else{
            kp=key;
        }
        str++;
    }
    if (found==1){
        // copy the value to a buffer and terminate it with '\0'
        while(*str && *str!=' ' && *str!='&' && i<STR_BUFFER_SIZE){
            strbuf[i]=*str;
            i++;
            str++;
        }
        strbuf[i]='\0';
    }
    return(found);
}
```

```
int8_t analyse_cmd(char *str)
```

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```
{
    int8_t r=-1;

    if (find_key_val(str,"cmd")){
    if (*strbuf < 0x3a && *strbuf > 0x2f){
        // is a ASCII number, return it
        r=(*strbuf-0x30);
    }
    }
    return r;
}

uint16_t print_webpage(uint8_t *buf)
{
    uint16_t plen;
    plen=es.E_fill_tcp_data_p(buf,0,PSTR("HTTP/1.0 200 OK\r\nContent-Type: text/html\r\n\r\n"));
    plen=es.E_fill_tcp_data_p(buf,plen,PSTR("<center><p><h1>Thanks for using geeetech.com products</h1></p> "));
    plen=es.E_fill_tcp_data_p(buf,plen,PSTR("<hr><br> <h2><font color=\"blue\">-- Congratulations!! -- "));
    plen=es.E_fill_tcp_data_p(buf,plen,PSTR("<br> Your Arduino is online now "));
    plen=es.E_fill_tcp_data_p(buf,plen,PSTR("<br> Enjoy it"));
    plen=es.E_fill_tcp_data_p(buf,plen,PSTR(" <br></font></h2> "));
    plen=es.E_fill_tcp_data_p(buf,plen,PSTR("</center><hr>
href=\"http://www.geeetech.com\">www.geeetech.com<a>"));

    return(plen);
}
```

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