



OCS Training Workshop LAB13

Ethernet – FTP and HTTP servers

Introduction

The training module will introduce the FTP and Web hosting capabilities of the OCS product family. The user will be instructed in setting up the FTP server and Web server sections of the OCS firmware.

The training does not aim to give instruction in web page creation.

Ethernet – FTP server

FTP Technicalities

File Transfer Protocol (FTP) is a standard Client/Server Internet protocol, based on RFC959, which supports efficient and reliable file transfers over a TCP/IP network. In this context, the Ethernet Module acts as an FTP Server, that will respond to file transfer requests from one or more FTP Clients.

Note: FTP protocol is supported only by OCS Models which have built-in Ethernet *and* an OCS file system with removable media (such as Compact Flash or MicroSD). For OCS Models that do not have an OCS file system, the **FTP (File Transfer)** checkbox will be grayed out in the Ethernet Module Configuration dialog.

To enable and configure the FTP support for an OCS select the Ethernet Module Configuration and then tick the FTP (File Server) box. With the box still selected click the 'Configure Selected Protocol' button to configure FTP access.

Module Configuration

I/O Map | **Module Setup**

Register Usage

Default Settings	Register	Direction
IP Address: 192 . 168 . 254 . 128	[] 32-BIT	Read Only
Net Mask: 255 . 255 . 255 . 0	[] 32-BIT	[]
Gateway: 0 . 0 . 0 . 0	[] 32-BIT	[]
Status:	[] 16-BIT	Read Only
Version:	[] 16-BIT	Read Only

☐ Use CAN ID for last Octet

☐ Enhanced Configuration

Protocol Support

- ☐ ICMP (Ping)
- ☐ EGD (Ethernet Global Data)
- ☐ SRTP Slave (90-30 Service Request)
- ☐ Modbus TCP Slave
- ☐ Ethernet/IP
- ☐ FTP (File Server)
- ☐ HTTP (Web Server)
- ☐ ASCII Over TCP/IP

Configure Selected Protocol

OK Cancel Apply

Configuring FTP Access

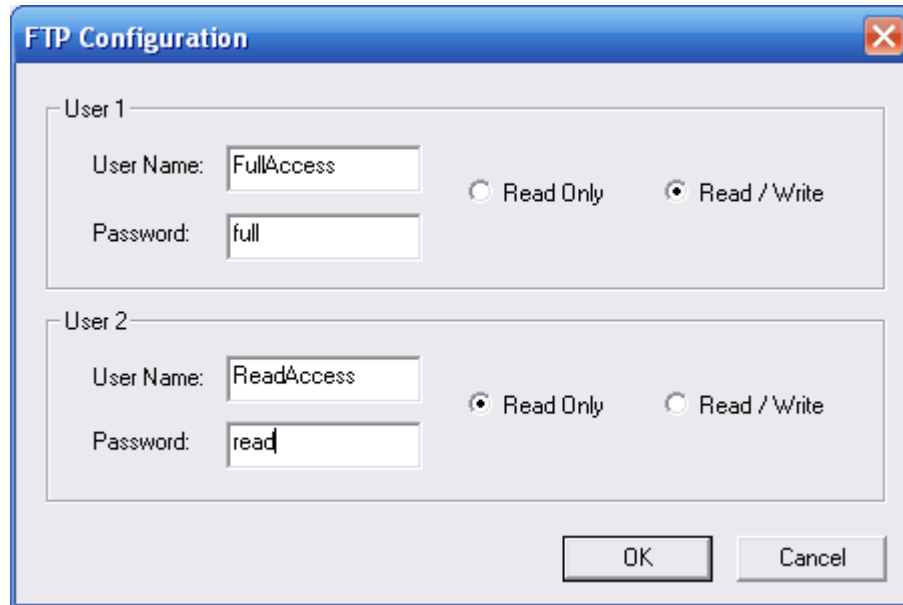
The Ethernet Module's FTP Server supports both anonymous and authenticated file transfers between an FTP Client and the OCS file system. Authenticated file transfers require that the FTP Client provide one of two possible User Name and Password pairs, before the OCS file system can be accessed.

The image shows a 'FTP Configuration' dialog box. It is divided into two sections, 'User 1' and 'User 2'. Each section contains a 'User Name:' label followed by a text input field, a 'Password:' label followed by a text input field, and two radio buttons labeled 'Read Only' and 'Read / Write'. The 'Read / Write' radio button is selected for both users. At the bottom right of the dialog are 'OK' and 'Cancel' buttons.

Properly authenticated, an FTP Client can access OCS file system functions, which include file read, file create, file delete, file rename, file write, directory read, directory create and directory delete.

- During FTP configuration the user can optionally set up two supported FTP Accounts as **User 1** and/or **User 2** as follows:
 - **User Name:** Enter an alphanumeric string (up to 40 characters) for the FTP Client's User Name.
 - **Password:** Enter an alphanumeric string (up to 40 characters) for the FTP Client's Password.
 - **Read Only:** Select this option to give the FTP Client read-only access to the OCS file system.
 - **Read / Write:** Select this option to give the FTP Client read-write access to the OCS file system.
- User Names and Passwords are case-sensitive and, by default, are empty for both User 1 and User 2. In this case, *anonymous* FTP Clients can access OCS files, but file access will be read-only. In a typical application, both User 1 and User 2 will be configured - one with read-only access and the other with read-write access.
- When using FTP to exchange files with an OCS, the user should know that the OCS file system implements an "8.3" filename format, which means file and directory names consist of up to 8 characters, followed by an optional dot, and an optional extension with up to 3 characters.

Try setting the following FTP configuration :

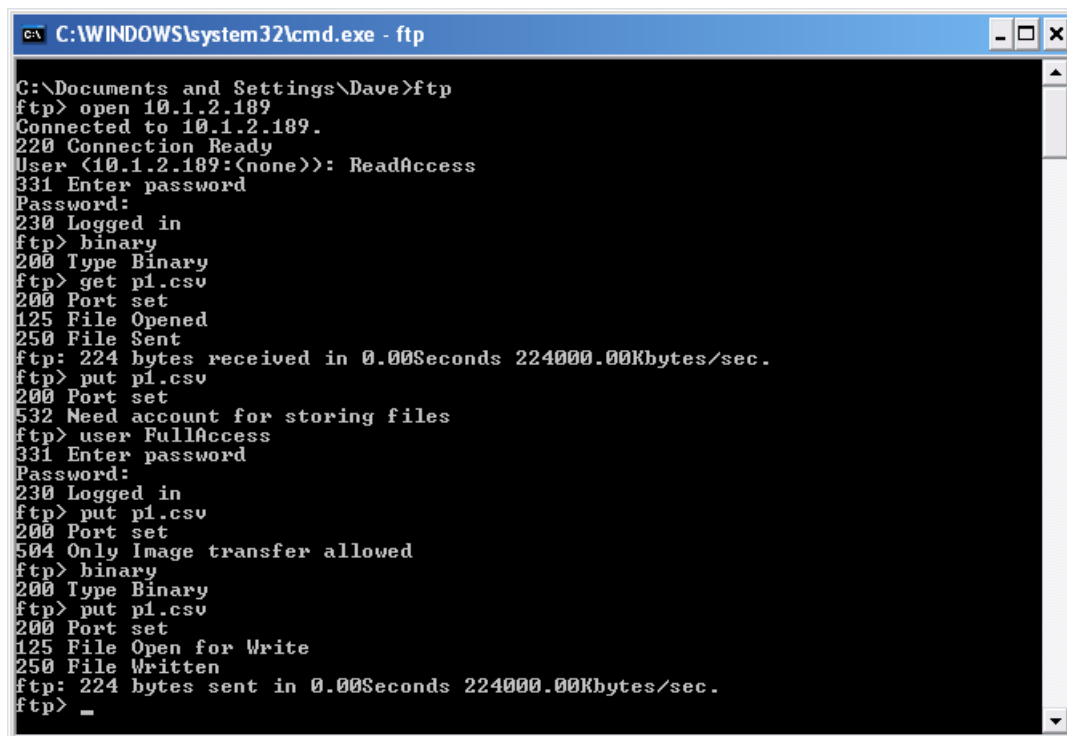


The image shows a 'FTP Configuration' dialog box with two sections: 'User 1' and 'User 2'. In the 'User 1' section, 'User Name' is 'FullAccess', 'Password' is 'full', and the 'Read / Write' radio button is selected. In the 'User 2' section, 'User Name' is 'ReadAccess', 'Password' is 'read', and the 'Read Only' radio button is selected. 'OK' and 'Cancel' buttons are at the bottom right.

User	User Name	Password	Read Only	Read / Write
User 1	FullAccess	full	<input type="radio"/>	<input checked="" type="radio"/>
User 2	ReadAccess	read	<input checked="" type="radio"/>	<input type="radio"/>

Sample FTP Session

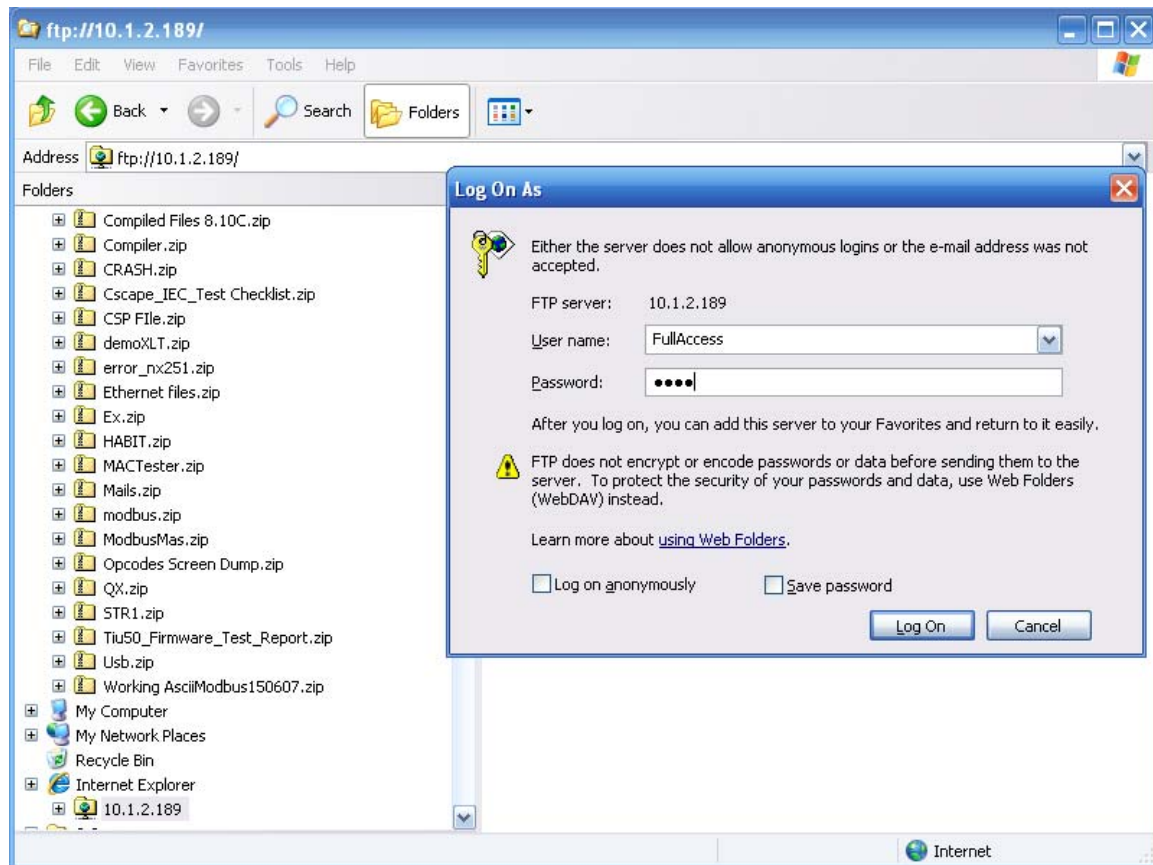
With the above configuration loaded to OCS and removable media fitted to the unit, run the standard FTP package supplied with windows from a command prompt.



The image shows a Windows command prompt window titled 'C:\WINDOWS\system32\cmd.exe - ftp'. It displays the output of an FTP session, including connection details, file transfers, and user authentication.

```
C:\WINDOWS\system32\cmd.exe - ftp
C:\Documents and Settings\Dave>ftp
ftp> open 10.1.2.189
Connected to 10.1.2.189.
220 Connection Ready
User (10.1.2.189:(none)): ReadAccess
331 Enter password
Password:
230 Logged in
ftp> binary
200 Type Binary
ftp> get p1.csv
200 Port set
125 File Opened
250 File Sent
ftp: 224 bytes received in 0.00Seconds 224000.00Kbytes/sec.
ftp> put p1.csv
200 Port set
532 Need account for storing files
ftp> user FullAccess
331 Enter password
Password:
230 Logged in
ftp> put p1.csv
200 Port set
504 Only Image transfer allowed
ftp> binary
200 Type Binary
ftp> put p1.csv
200 Port set
125 File Open for Write
250 File Written
ftp: 224 bytes sent in 0.00Seconds 224000.00Kbytes/sec.
ftp> _
```

Using Microsoft Explorer as FTP client.



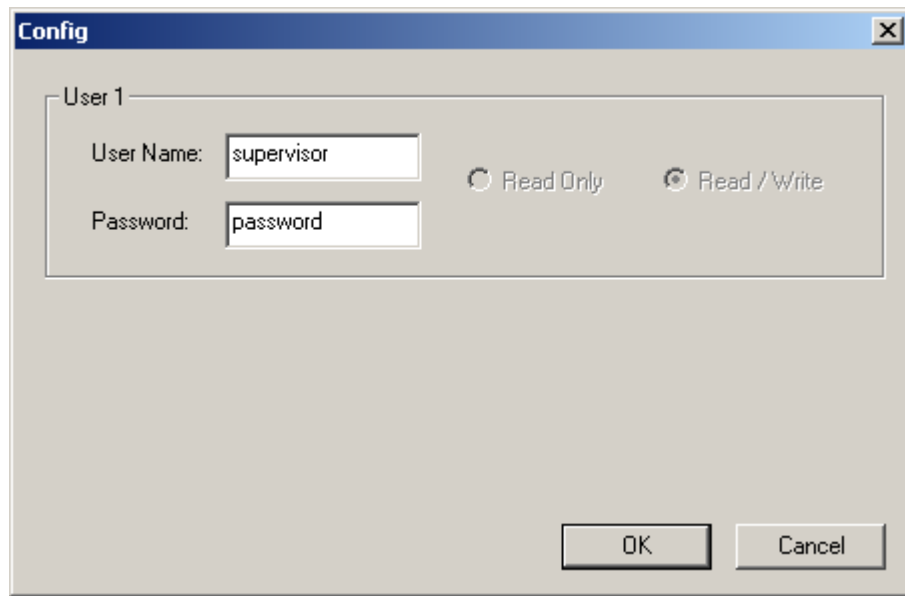
Microsoft Explorer can also be used as an FTP client as above – but beware! Previous versions of Explorer have not always adhered strictly to the FTP standard and not all functions worked.

File Conflicts

- The OCS file system allows multiple concurrent file accessing. For example, an FTP Client can read a file at the same time the OCS ladder program is logging data to it. If there is a file access conflict, such as an FTP Client attempting to delete a file that is currently being read or written by ladder, the file delete request is denied and an error response is sent to the FTP Client.

Ethernet – Web server

- Simply select the HTTP tick box to enable the web server functionality.
- The Web server can be password protected to avoid unauthorised access (user name and password can be up to 40 characters long)



- The web server retrieves files stored on CompactFlash and sends them to the client.
- The user has the possibility of displaying register values from html pages as well as sending values to the OCS.
- Files are stored on CompactFlash in 8.3 file format.
- There is no default page access. The client has to specify a full url (e.g. 192.168.254.128/index.htm)
- Custom HTML files are created to suit the application. These files can be created with a simple text editor or with a 3rd party HTML Editor.
- Within the static HTML file, <iframe> and <form> tags respectively read and write OCS Register data, by referencing two specially named dynamic HTML files (**readreg.htm** and **writereg.htm**).

A Simple Web Page

Create a file 'Index.Html' with the following contents:

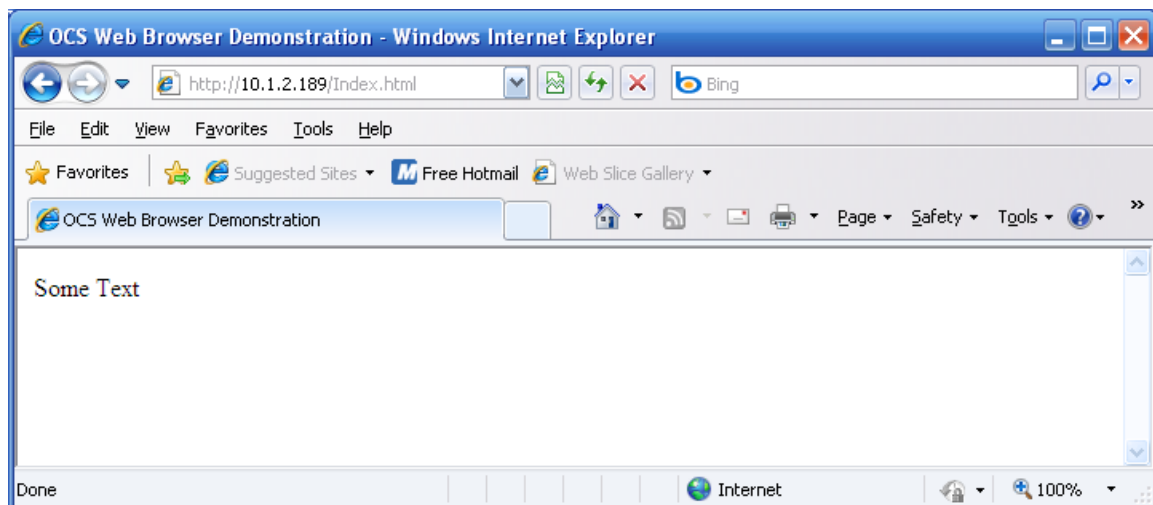
```
<HTML>
<HEAD>
<TITLE> OCS Web Browser Demonstration</TITLE>
</HEAD>
<BODY>
<COMMENT> Test File </COMMENT>
```

Some Text

```
</BODY>
</HTML>
```

And transfer this to the root directory of the Removable media card on the target OCS.
(Perhaps using FTP)

Once the file is there use start Internet explorer and select URL
'http://10.1.2.189/Index.html' to view the page.



Embedding Live OCS Data within an HTML Page

- The read register operation is performed within an IFRAME tag.

```
<iframe src="readreg.htm;reg-R11;fmt-UINT;rfs-2">
</iframe>
```

- Reads R11 in UINT format and refreshes the value every 2 seconds.

- The formats available are:
 - BOOL, BOOL-<on text>-<off text>, BIN, HEX, INT, UINT, DINT, UDINT, REAL, REAL-E, ASCII-<num characters> and IPADR

Modify the Index.Html to contain the following

```
<HTML>
<HEAD>
<TITLE> OCS Web Browser Demonstration</TITLE>
</HEAD>
<BODY>
<COMMENT> Test File </COMMENT>
<p>Some Text</p>
<p> R1 = <iframe src="readreg.htm;reg-R1;fmt-UINT;rfs-2" height="30" width="50"
        marginwidth="0" marginheight="0" align="middle"></iframe> </p>
<p> R11 = <iframe src="readreg.htm;reg-R11;fmt-UINT;rfs-2" height="30" width="50"
        marginwidth="0" marginheight="0" align="middle"></iframe></p>
</BODY>
</HTML>
```

And transfer the updated file to the removable media.

Refresh your internet browser to see the live values on screen.

- The refresh rate may be from 0 to the limits set by the browser. If this parameter is omitted the page has to be refreshed manually.
- When using an **Internet Explorer** browser to view OCS web pages that employ the rfs parameter, the browser plays the currently configured **Start Navigation** sound (a short “tick” by default) for each refresh. To disable the “ticking”, (1) open the **Windows Control Panel**, (2) click the **Sounds** or **Sound and Audio Devices** icon or link and (3) turn off the **Start Navigation** sound by selecting **(None)** for it in the drop-down list.

Updating OCS Register Data from an HTML Page

The write register operation is performed within a FORM tag.

- `<form action="writereg.htm;reg-R6;fmt-UINT" method="post">`
 `<input type="text" name="value" value="0" />`
 `<input type="submit" value="Send" />`
 `</form>`
- This will write a value into %R6 when the Send button is pressed.
- Important: The OCS HTTP Server requires the name="value" attributes to appear exactly as shown.

Modify the Index.Html to contain the following

```
<HTML>
<HEAD>
<TITLE> OCS Web Browser Demonstration</TITLE>
</HEAD>
<BODY>
<COMMENT> Test File </COMMENT>
<p>Some Text</p>
<p>R1 = <iframe src="readreg.htm;reg-R1;fmt-UINT;rfs-2" height="30" width="50"
      marginwidth="0" marginheight="0" align="middle"></iframe> </p>
<p>R11 = <iframe src="readreg.htm;reg-R11;fmt-UINT;rfs-2" height="30" width="50"
      marginwidth="0" marginheight="0" align="middle"></iframe></p>
<p><form action="writereg.htm;reg-R6;fmt-UINT" method="post">
<input type="text" name="value" value="0" />
<input type="submit" value="Send" />
</form></p>

</BODY>
</HTML>
```

Other Data Formats.

As well as UINT the following data types are supported in Fmt field:

fmt-BOOL
fmt-BOOL-ON-OFF
fmt-BOOL-YES-NO
fmt-BIN
fmt-HEX
fmt-INT
fmt-UINT
fmt-DINT
fmt-UDINT
fmt-REAL
fmt-REAL-E
fmt-ASCII-10
fmt-IPADR

Investigate use of some of these formats with the Embedded Data Read and Write items.

Remember previously we loaded the Unit's IP Address in to a Register pair in the OCS as part of the Ethernet configuration – try displaying this as part of the Web page using the fmt-IPADR format.

Java Applets

It is recommended to remove the password option before running the Java Applet example.

Copy the file set from the directory 'JavaAppletDemo' on the accompanying CD and

Java Applets may be embedded on an OCS page to give a more integrated feel to the embedded web pages.

Collect the Java applets together and store them in the same directory of the removable media card as the HTML page which 'ties them all together'

Note that the filing system on the OCS only supports 12 character file names – typically java applets will be renamed in 6.5 form where the file extension is “.class”

End of LAB 13