FLEX 3000 & Flex 3500 Start Up Guide

Default IP Address: 192.168.1.200 or 192.168.1.205
Default UN: admin
Default PW: admin

D2D Technologies Support
904-323-4777 option 2
http://www.d2dtechnologies.com/support/

CONTENTS:

1.D2 FLEX 3000 and 3500 Backplane:

A. Power: Supplied by 5VDC 3.6 amp external power supply provided with unit. Redundant power supply optional.
B. HDMI Port: Currently not used.
C. Ethernet Gigabit Data Port: Used for configuring the FLEX 3000 via the D2Manage web server and sending/receiving Transport Streams over IP with UDP or SRT
D. ASI RX: Inputs for receiving ASI Transport Streams into the unit.
E. ASI TX: Output for sending ASI Transport Streams away from the unit.

2. D2 FLEX 3000 Base Model

The 3000 will simply send out whatever it receives in with no other functions available. All ASI programs in, get immediately sent to the IP Output. ALL IP in, will get sent to the ASI Output. All other menu items are erroneous.

If you need to add any features, they can be added with a software upgrade. Contact your distributer or D2D Technologies for a quote.

BASE Model - Flex 3000

The D2 FLEX 3000 comes standard with ASI to IP and IP to ASI conversion that allows the transmission of SRT. (Secure Reliable Transport). SRT is an open source video transport protocol and technology stack that optimizes streaming performance across unpredictable networks.

D2 FLEX 3500 Upgrade:

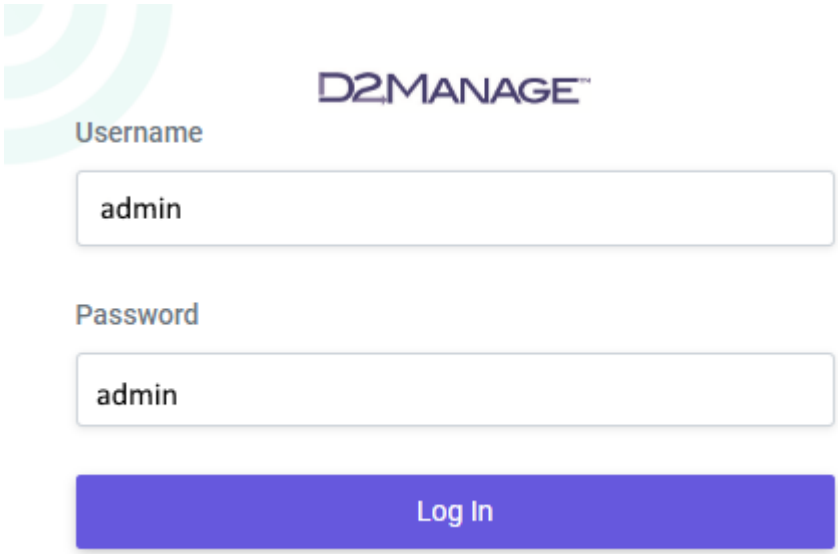
The 3500 Upgrade feature offers the ability to manipulate the VCT (Virtual Channel Tables), add or delete static PSIP. Change short names and major / minor channel numbers as well as add or delete minor channels. It will also allow you to send out the Transport Stream on both IP and ASI. Once upgraded, you can add the following features:

D2 GUIDE - Dynamic PSIP, EPG insertion feature:
The GUIDE feature provides the essential tools to create and maintain the Electronic Program Guide (EPG) tables and Program and System Information Protocol (PSIP) guide data for ATSC digital transport streams. The program guide information can be imported from a standard spreadsheet and is used by D2Guide to create the EIT tables necessary to meet FCC PSIP requirements. ***(NOTE: In order for the GUIDE Feature to operate, the 3500 upgrade must be purchased and installed first)***

D2 AERT- EAS insertion feature:
D2Alert is the answer for inserting digital video from an Emergency Alert System (EAS) into all of the programs of your ATSC digital transport stream. The D2Alertsystem constantly monitors the EAS digital video signal and when a valid alert is found, it is automatically inserted into all of the configured programs until the alert is complete. Rest assured that withD2Alert, you can comply with FCC requirements and quickly inform your viewers in the event of an emergency. D2Alert is an option that enables theD2Mux to detect an EAS digital video signal and insert it into the configured multiplex. The applications include traditional distribution systems where EAS is required and extends into any digital video channel where program insertion is needed**.** ***(NOTE: In order for the ALERT Feature to operate, the 3500 upgrade must be purchased and installed first)***

3.Connecting to the D2Flex 3000

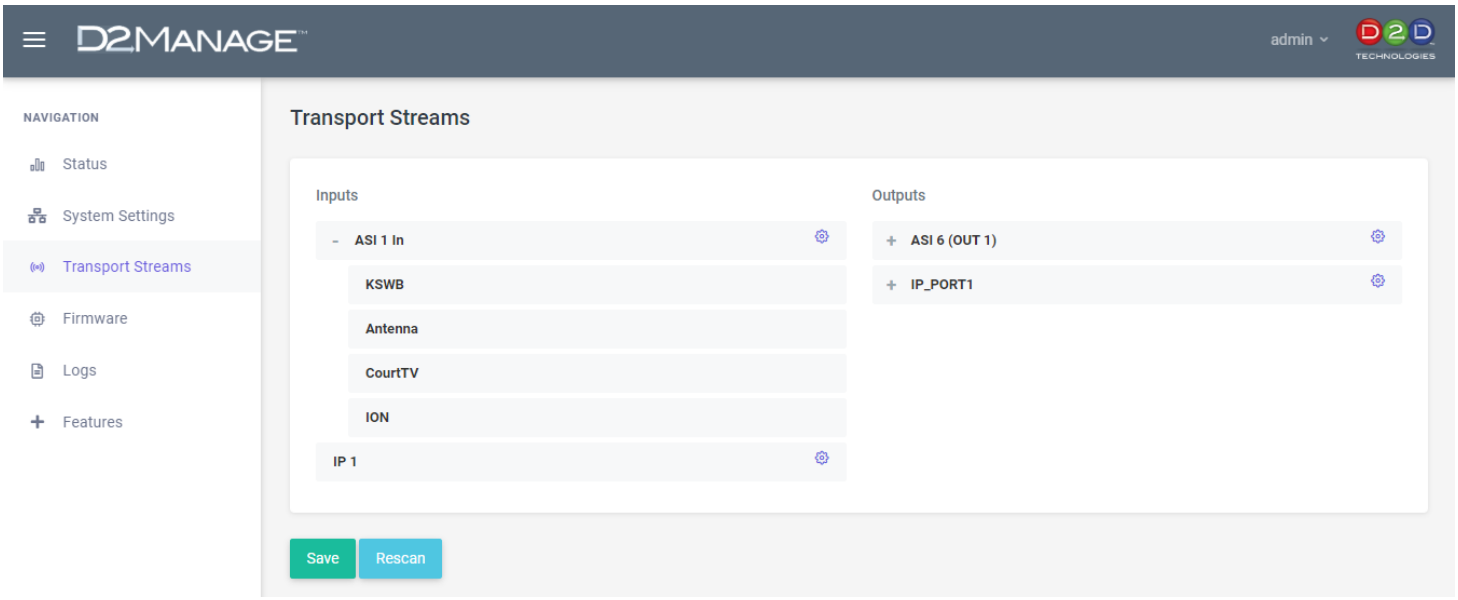
The D2Flex runs the D2Manage web server used for configuration.
Use a web browser to connect to the control IP address of unit.
Default IP Address: 192.168.1.200 or 192.168.1.205
Default UN: admin
Default PW: admin



Once you type in the IP address, the username and password, you will land on the "System Status" Page.

This will display the incoming payload data rate in green and the total aggregate data rate including null packets (Stuffing) in grey.

Go to the “Transport Streams” menu, click on “Rescan” and let it scan, then if you click on the “plus sign” (+) next to the ASI In, you should see some programs show up.

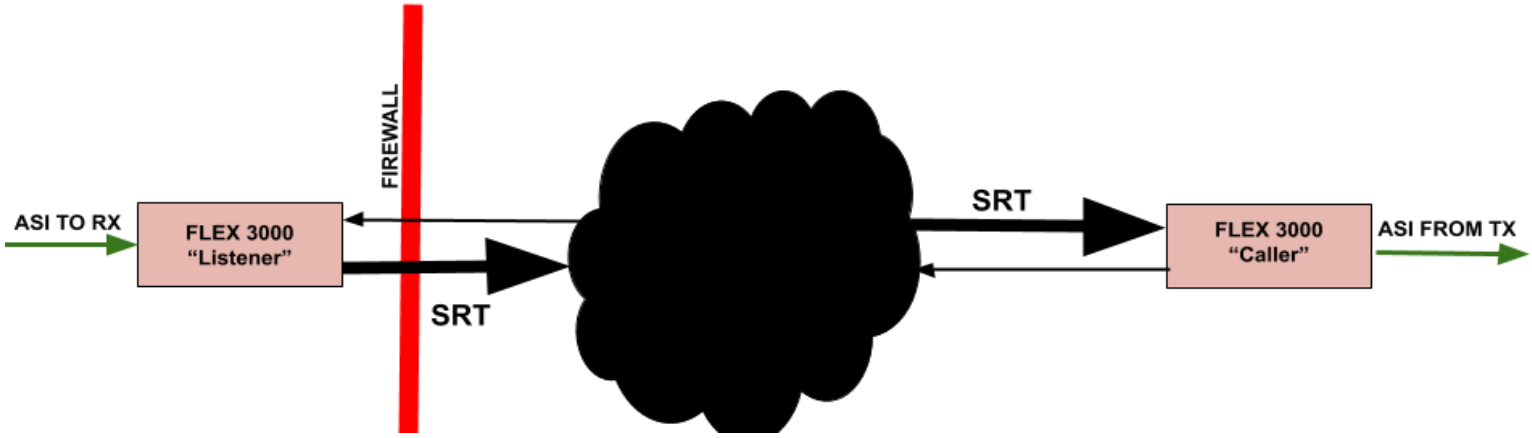


4.Sending ASI Via SRT:

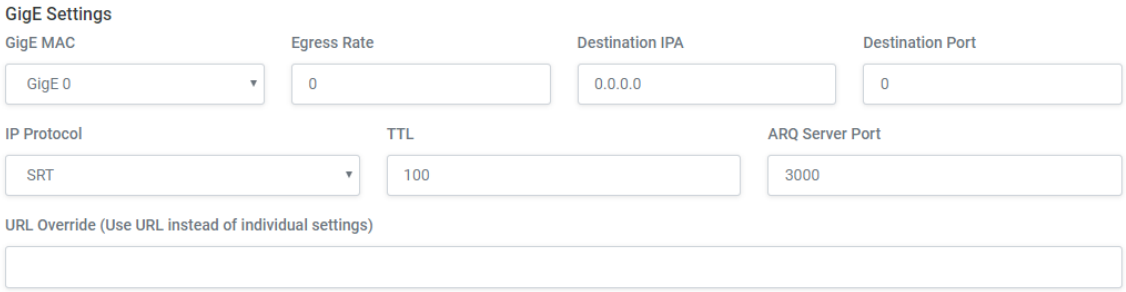
1. SRT Server (Listener):

The SRT server sends a transport stream by listening for an SRT client to call and initiate a connection. Configure the IP port transport stream's GigE Setting on the Output Port Edit Transport Stream page.

SRT Server (Listener) Setup: This is the side that us actually *sending* the SRT



1. Go to Transport Streams and click on the gear icon by the IP Output
2. Go to bottom of the IP Output page.
3. Disable UDP by setting Destination IPA to 0.0.0.0 and Destination Port to 0.
4. Set GigE MAC to GigE 0 (Host). SRT is only available on GigE 0.
5. Set IP Protocol to SRT.
6. If the unit has the REBRAND or GUIDE feature, set the egress rate.
7. If it is a base model, the egress rate will not make a difference. It will put out the same rate that it is receiving. You can leave it at "0"
8. Set TTL to 100.
9. Set ARQ Server Port to the UDP port you want to use for SRT transmission. If the SRT listener is behind a firewall, the router must forward the SRT port to the SRT server IP Address



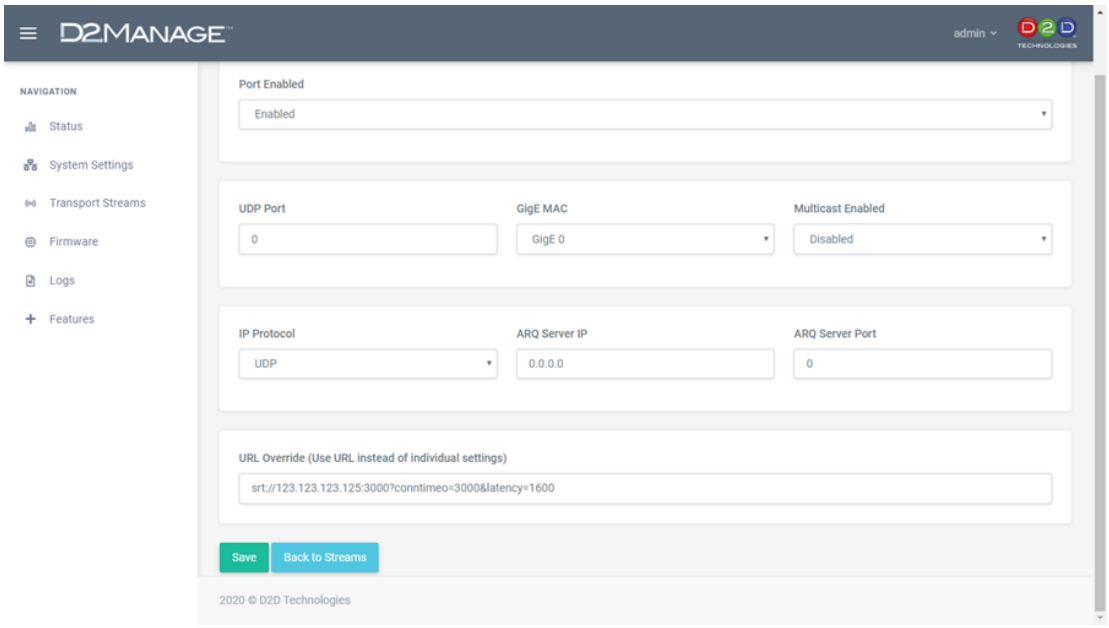
Note: If you wish to send SRT with the Flex 3500, you will need to "Drag and Drop" any programs you wish to send out.

Be sure to open the correct port on your LAN. The default is 3000, but you can make it any port you wish.

2. SRT Client (Receive Side aka "Caller")

The SRT client receives a transport stream by calling an SRT server and initiating a connection. Configure the IP input port transport stream's GigE Setting on the Input Port Edit Transport Stream page.

1. Disable UDP by setting UDP port and Multicast IP address to 0.0.0.0
2. Set GigE MAC to GigE 0 (Host). SRT is only available on GigE 0.
3. Set IP Protocol to SRT.
4. Use the URL Override. In the following format:
5. *srt://[public IP address of the listener(server)]:[port# of the listener from step 5]?[continuity timeout(conntimeo)]:[latency]. It is best to leave the continuity timeout at the default of 300 and the latency of 1600*
6. For example: srt://24.129.111.190:3000?conntimeo=3000&latency=1600
7. A good rule of thumb for the latency is 4x the ping time between SRT client and server. So far, it seems to work best at 1600. So start there.
8. Reset unit from System Page
9. Look for a green incoming IP rate and a green outgoing ASI rate on the caller side

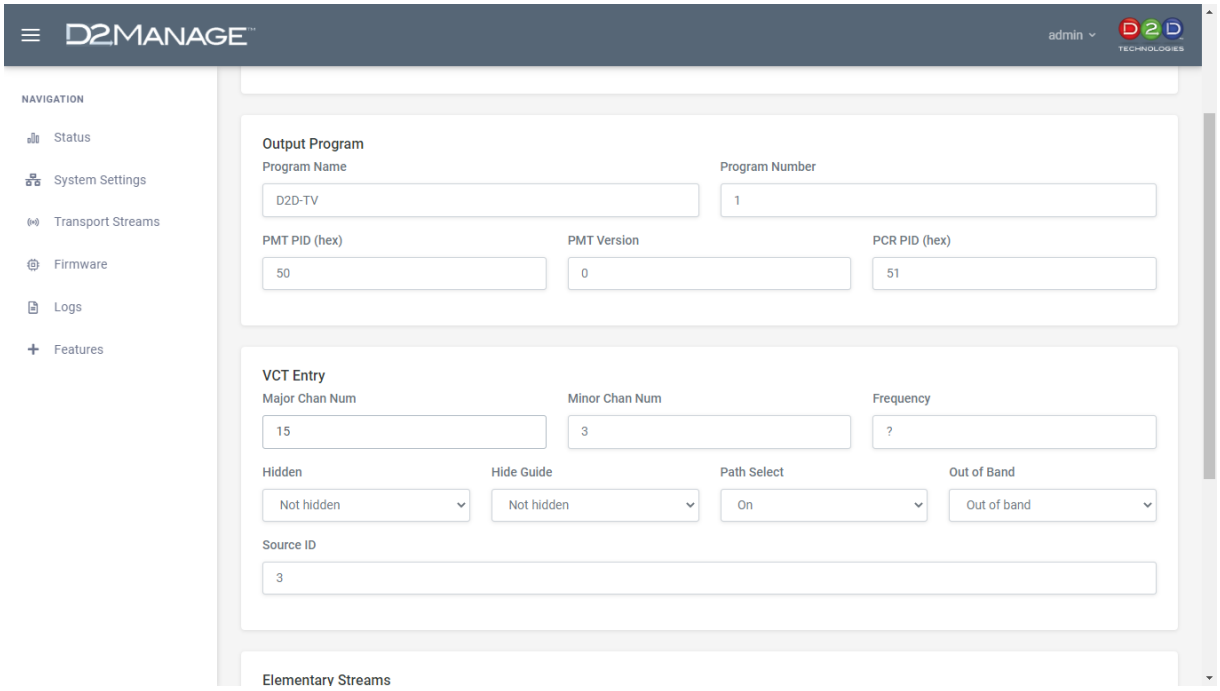


5.Re-branding the transport stream (VCT):

-Version 3500 Only

1. Press “Rescan” to renew all incoming streams. The rescan will take 15-20 seconds
2. From the Transport streams menu, click on the plus icon and drag the service you want to send to an output.
3. Press “Save”.
4. Click on the “Gear” icon of the ASI OUT (Not the individual outs) to make changes to the overall output.
5. From here, you can manipulate the names and numbers.
6. You can modify elementary PIDS from the “Modify Elementary Streams” button
7. Be sure to hit save and apply
8. Reset unit from System Page.

Note: If you wish to send SRT with the Flex 3500, you will need to “Drag and Drop” any programs you wish to send first.



6.GUIDE Feature: Adding dynamic PSIP and updates to the EPG.

3. Adding dynamic PSIP via TitanTV or Gracenote.

1. Click on the gear icon on the appropriate output
2. That will bring you to the Edit Stream ASI (x) (OUT 1) menu
3. Set your FCC issued TSID
4. Leave the Version Number at 0
5. Set tables to ATSC
6. Set the PSIP mode to Automated.
7. Enter in your TitanTV or Gracenote credentials.
8. Set your Egress rate to 19400000.
9. Click “Save”

4. Adding dynamic PSIP manually with a spreadsheet:

1. Click on the gear icon on the appropriate output
2. That will bring you to the Edit Stream ASI (x) (OUT 1) menu
3. Set your FCC issued TSID THIS IS IMPORTANT!
4. Leave the Version Number at 0
5. Set tables to ATSC
6. Set the PSIP mode to Automated.
7. No need to set any credentials.
8. Set your Egress rate to 19400000.
9. Click “Save”

5. Building and formatting the spreadsheet

a. Use an Excel format like this:
air_date(YYYYMMDD) air_time(HHMM) duration(HHMM) Event ID
Event Title (EIT) Event Description (ETT) Entire Audience

1.Air_date: You have a choice. If you tend to air the same programs every week with little changes, you can use a day of the week format with 00 being Sunday and Saturday being day 06. Otherwise, put in the actual day the program airs minus your GMT offset. EXAMPLE: 9:00 PM. Eastern Daylight Time in Florida is actually 01:00 UTC the next day. For ore on GMT stuff, go here:
https://www.youtube.com/watch?v=GODY9DatMdU

2. Air_time: PSIP is set on a UTC standard. (Coordinated Universal Time, Greenwich Mean Time or Zulu Time). Therefore, you must add that to the program times of the stations time zone. If the station is currently on Eastern Daylight Time, the UTC offset is + 4, Eastern Standard time is +5.

3. Duration: The length of the program in Hours and minutes.
4. Event ID. Start your first program of the day with this and repeat it daily.
5. Event Title: The actual name of the show
6. Event Description: A brief description of the show.
7. Entire Audience: Use G, PG, PG13, R for audience ratings.

Once you have an Excel sheet done, it should look like this:

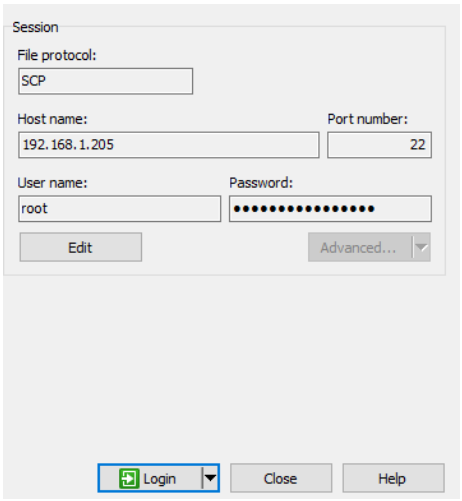
A	B	C	D	E	F	G	H
air_date(YYYYMMDD)	air_time(HHMM)	duration(HHMM)	Event ID	Event Title (EIT)	Event Description (ETT)	Entire Audience	
20200704	0000	0030	00003	D2D Prog 3	D2D Prog 3 Extended Text	None	
20200704	0030	0030	00004	D2D Prog 4	D2D Prog 4 Extended Text	TV-G	
20200704	0100	0030	00005	D2D Prog 5	D2D Prog 5 Extended Text	TV-14	
20200704	0130	0030	00006	D2D Prog 6	D2D Prog 6 Extended Text	TV-MA	
20200704	0200	0200	00007	D2D Prog 7	D2D Prog 7 Extended Text		
20200704	0400	0100	00008	D2D Prog 8	D2D Prog 8 Extended Text	Entire Audience	
20200704	0500	0100	00009	D2D Prog 9	D2D Prog 9 Extended Text	None	
20200704	0600	0100	00010	D2D Prog 10	D2D Prog 10 Extended Text	TV-G	
20200704	0700	0030	00011	D2D Prog 11	D2D Prog 11 Extended Text	TV-14	

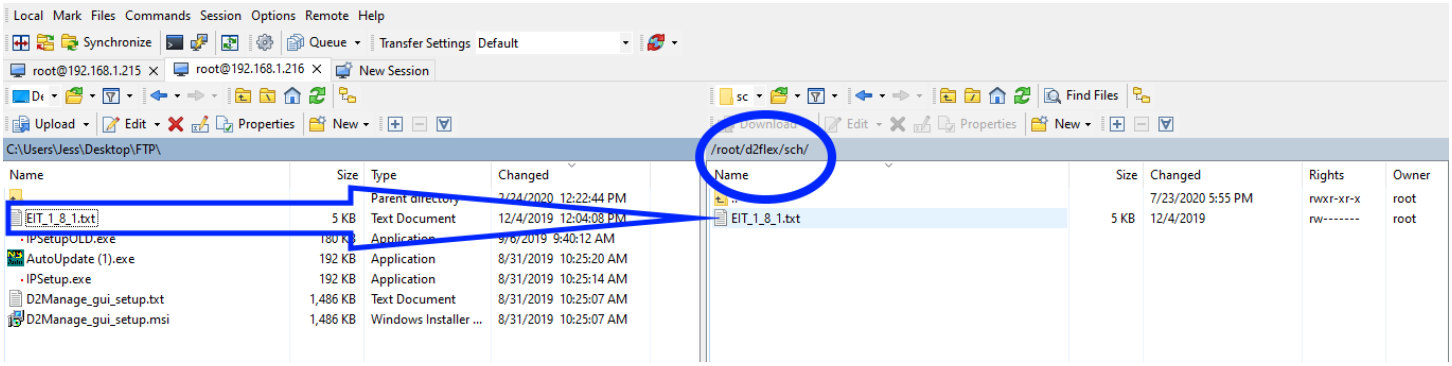
8. Save the spreadsheet in the following format: As a tab delimited text file with the following file name: EIT_tsid_maj_min.TXT
tsid = Transport Stream ID,
maj = Major Channel# and
min = Minor Channel#

EXAMPLE: For channel 18.1 with a TSID of 210: EIT_210_18_1.TXT for
for transport stream ID 210, major channel# 18, minor channel# 1.

9. Move the spreadsheet into the FLEX by using WinSCP: *Download WinSCP here*:
https://winscp.net/eng/download.php

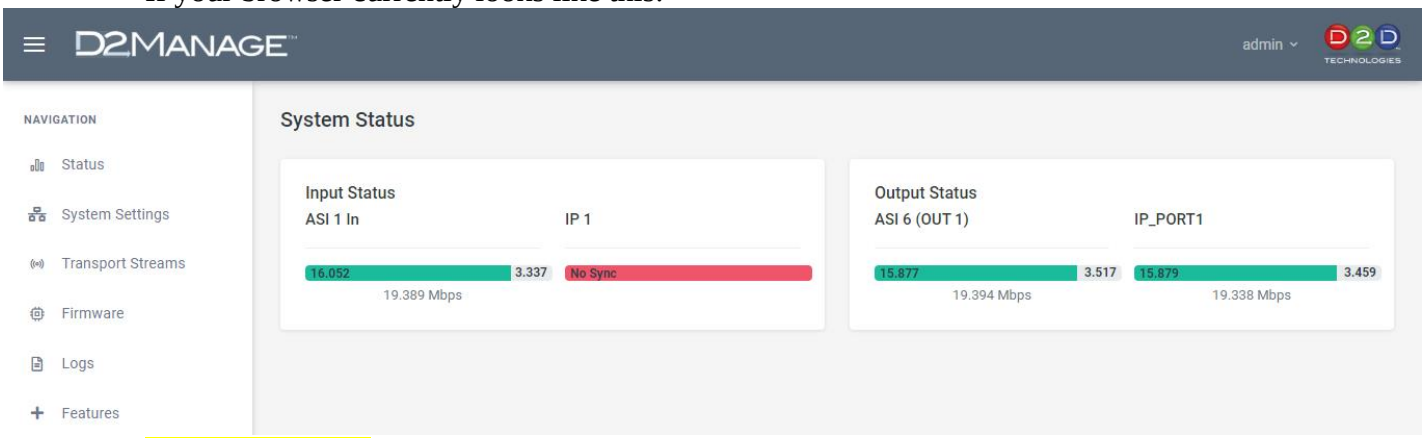
1. Once downloaded, open it up.
2. Select “New Site” and file protocol as “SCP”
3. Host Name: Is the IP address of the FLEX.
4. Username is: root.
5. Password is D2Dberry.
6. Navigate to sch Directory found in the root/d2flex directory. If there is no sch directory, create one.
7. Move (or copy) the .txt file you created in Excel.
8. Reset the unit, wait a few minutes and see if any PSIP is passing through.


Session
File protocol:
SCP
Host name:
Port number:
192.168.1.205
22
User name:
Password:
root
Edit
Advanced...
Login
Close
Help


Local Mark Files Commands Session Options Remote Help
Synchronize
Queue
Transfer Settings Default
root@192.168.1.215
root@192.168.1.216
New Session
Upload
Edit
Properties
New
Find Files
C:\Users\Jess\Desktop\FTP\
/root/d2flex/sch/
Name
Size
Type
Changed
Rights
Owner
EIT_1_8_1.txt
5 KB
Text Document
12/4/2019 12:04:08 PM
AutoUpdate (1).exe
192 KB
Application
8/31/2019 10:25:20 AM
IPSetup.exe
192 KB
Application
8/31/2019 10:25:14 AM
D2Manage_gui_setup.txt
1,486 KB
Text Document
8/31/2019 10:25:07 AM
D2Manage_gui_setup.msi
1,486 KB
Windows Installer ...
8/31/2019 10:25:07 AM
7/23/2020 5:55 PM
rwxr-xr-x
root
12/4/2019
rw-------
root

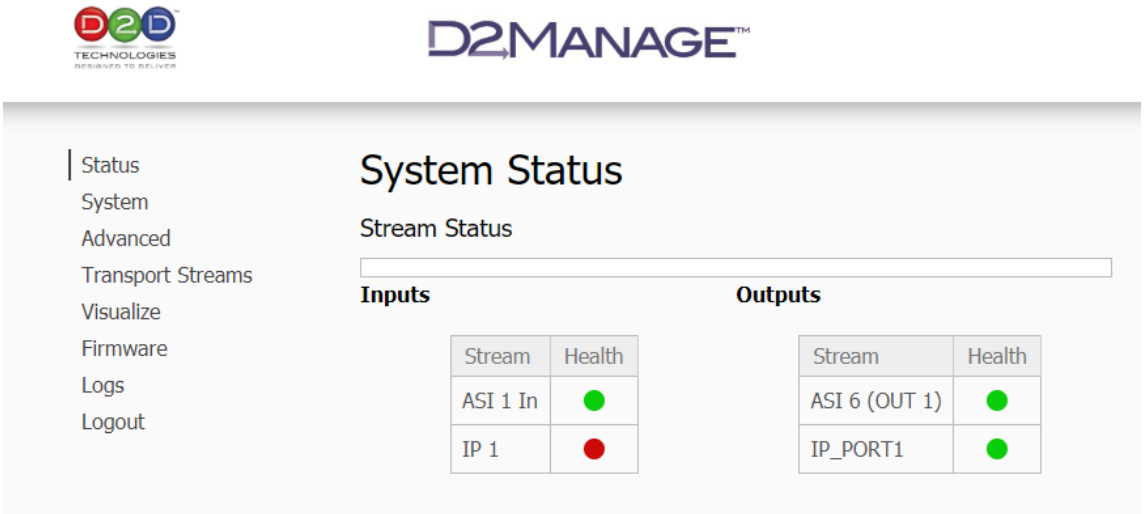
7.Firmware Upgrade – FLEX 3000

NOTE: This method is to be used to upgrade "Old Style" firmware to the new style.
If your browser currently looks like this:



STOP HERE! You can upload the new firmware by simply going the Firmware page on the browser and uploading the file found at http://www.d2dtechnologies.com/support/ firmware titled: ***Latest Flex 3000 Code released xx/xx/xxxx***

However, if your browser currently looks like this:



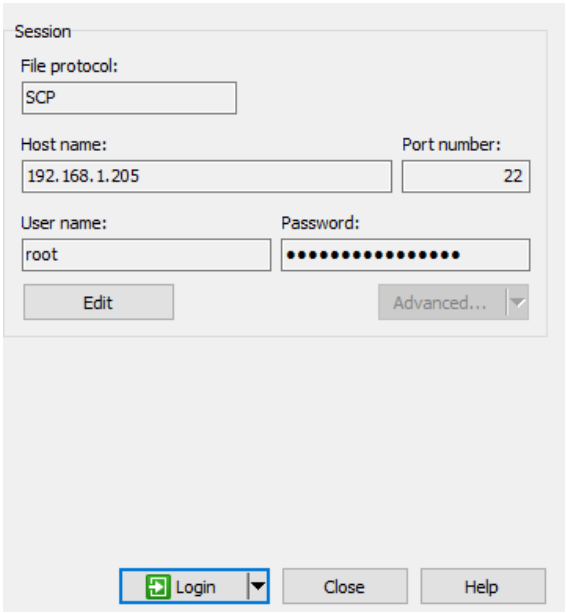
You are a candidate for this upgrade procedure. **Proceed.**

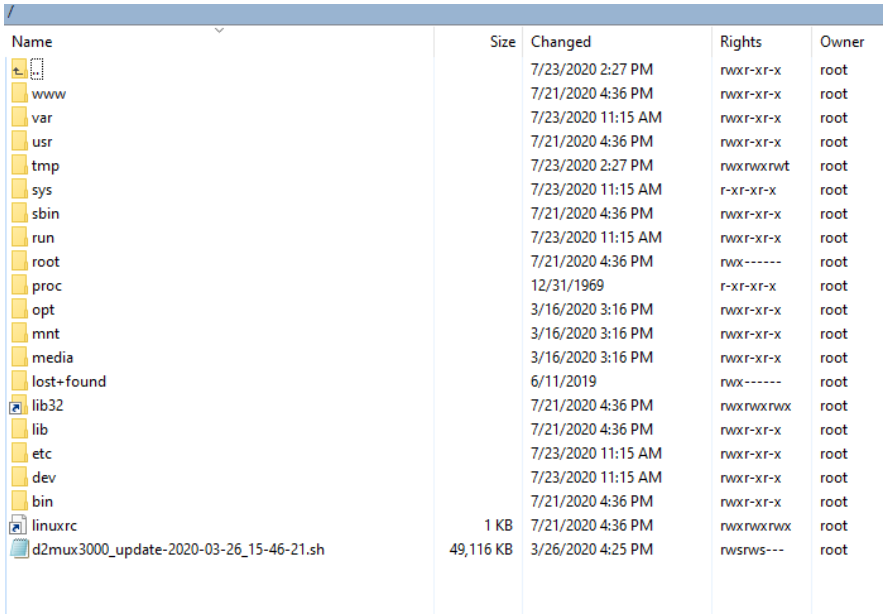
6. You will need:

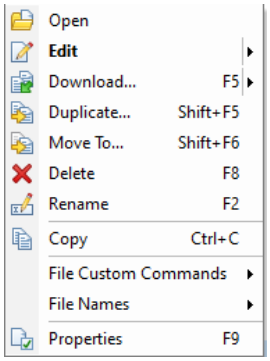
Access to the IP Ethernet port on the Flex 3000
PuTTY - Downloaded here: https://www.putty.org/
Win SCP – Downloaded here: https://winscp.net/eng/download.php
The unit will need to be rebooted at the end which will cause a drop in signal for about 15 seconds or less.

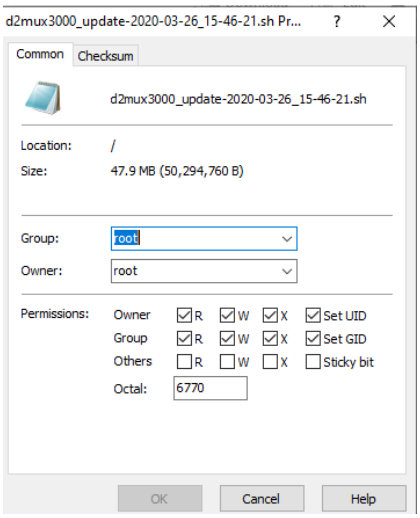
7. Instructions:

Go to http://www.d2dtechnologies.com/support/ and download the firmware titled: ***Latest Flex 3000 Code released xx/xx/xxxx***
Open Win SCP.
Select ***New Site***
Use the protocol SCP at the top
In the Host name box, type in the IP address of the Flex 3000
User name is: ***root***
Password is: ***D2Dberry***
Transfer the file over to the MAIN directory
Right click on the file and find Properties
Give the new file full Read/write (R,W,X) permissions

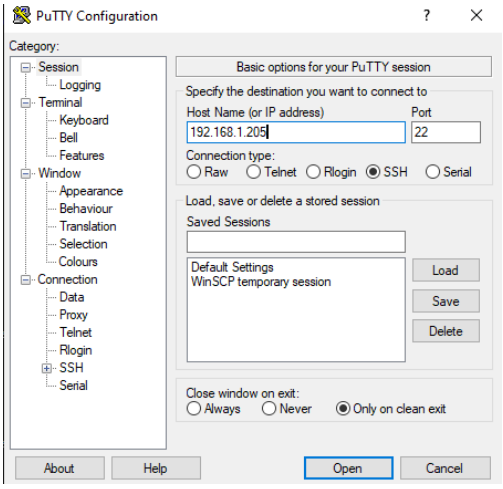


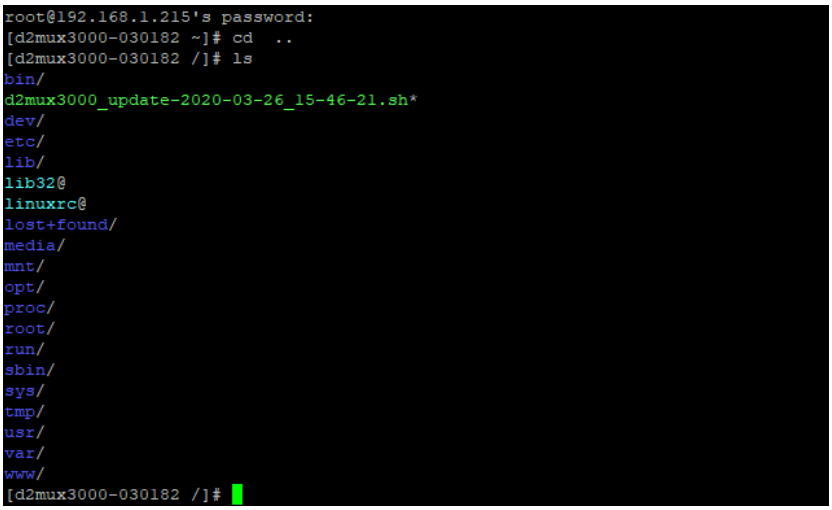






Open Putty and type the IP address of the Flex 3000 in the window.
The login is ***root***
The Password is ***D2Dberry***
Type ***cd .. (cd, space, space, period, period)***
That brings you to the top directory
Type ***ls***.
That should show you everything listed in the main directory





Type: ***./*** then type in the green file that begins with d2mux300……" *NOTE: You can highlight the file, then right click on it to paste it to the curser line.*
Press enter.
The file will unpack itself and a series of messages will display eventually ending with "Upgrade is done" This should take about 5 to 10 minutes.
Type "***reboot***"
Press enter.
Unit should reboot itself and come up with the same IP address and the same login credentials as it did before.
The new browser will look much different.

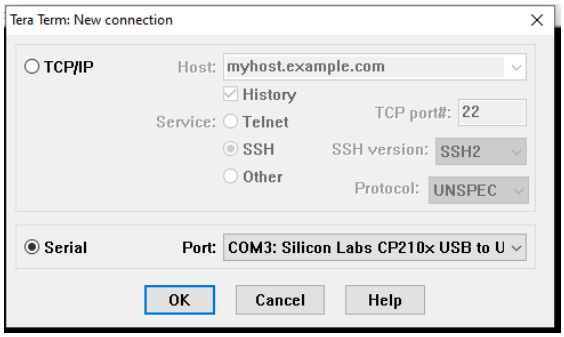
8.IP Address Discovery Procedure

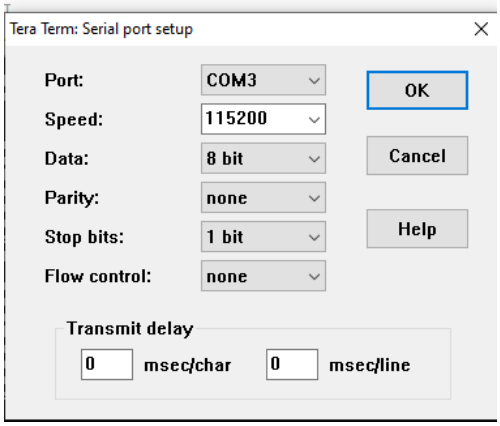
If you cannot connect via the IP address or lost the login/password

Remove the cover and plug in a mini USB into the USM_UART port closest to the SD drive

Use a terminal program such as TerraTerm to access it via serial protocols via 115200, 8n N,1.

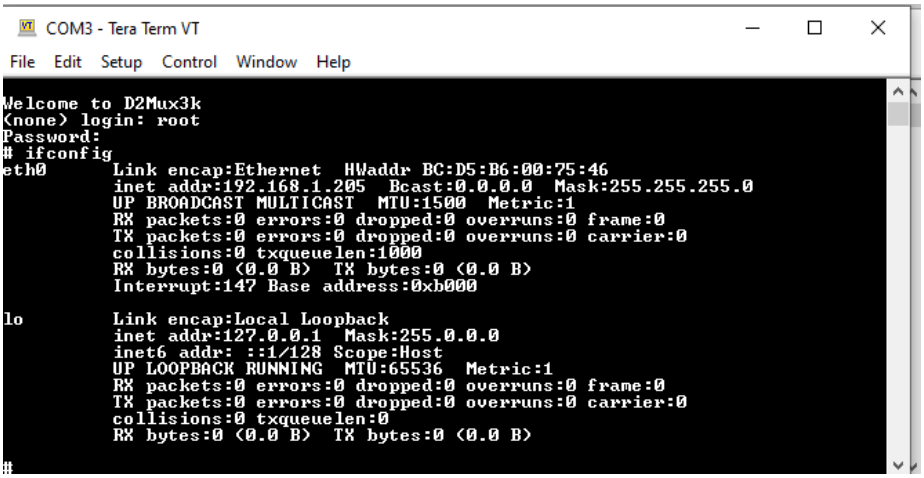
NOTE that a terminal program may need a third-party USB to UART Bridge VCP driver to function. You can download that driver here: https://www.silabs.com/products/development-tools/software/usb-to-uart-bridge-vcp-drivers





Login to the unit:
Login: root.
PW is: D2Dberry.
Type "ifconfig".

That will give you the IP address of the M&C



9.Troubleshooting Guide

1. No ASI into the server (listener)

- Go to the "TRANSPORT STREAMS" tab and press RESCAN.
- Make sure the ASI is plugged into the "RX" port
- Double check to make certain you have a valid ASI input

2. No IP into the server (listener)

- Double check the URL in the IP Input section. Make certain it is the correct syntax and IP address.
- Is the firewall on the sending side open to all UDP/TCP traffic?
- Make certain that the IP Output section is not trying to send SRT also. Set it to UDP

3. PSIP/EPG not showing up:

- It can take up to 5 minutes for the EIT tables to parse and make it through the stream. Give it a few minutes and rescan your TV / channel number. Try again.
- Check to make certain that you have "Generate STT Checked in the systems tab and that it is the correct time

4. No PSIP/EPG out of the IP/SRT output:

Currently, PSIP/EPG is only supported on the ASI output.

5. No ASI into the unit:

- Go to the "TRANSPORT STREAMS" tab and press RESCAN.
- Make sure the ASI is plugged into the "RX" port
- Double check to make certain you have a valid ASI input
- Try resetting the unit via the "Systems" tab

6. Wrong time/wrong program:

1. Be sure that the TV/STB reading the PSIP is set to the correct time
2. If you created the guide yourself from Excel, make sure you used GMT time and did the math correctly.
3. Set up an NTP server or set the correct time on the "Systems" page.

Something else? We are here to help!
http://www.d2dtechnologies.com/support/ or call: 904-323-4777 Option "2"