



XC DDS



Sutron Corporation
22400 Davis Drive
Sterling, Virginia 20164
TEL: (703) 406-2800
FAX: (703) 406-2801
WEB: <http://www.sutron.com>

Bringing the Benefits of Real-Time Data Collection to the World
Sutron Corporation, 22400 Davis Drive, Sterling, Virginia 20164

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Welcome to XC DDS

XConnect is Sutron Corporation's latest data collection, data processing and data storage software. Built on the strong principles of PcBase2, XConnect is compliant with today's 32-bit Windows operating systems and provides new tools and options for the user.

XConnect is a collection of executables designed to provide a complete solution for data collection, data handling, data viewing and data storage

The role of XC DDS within an XConnect data collection system is to retrieve DCP messages over the network from LRGS (Local Readout Ground Station) DOMSAT servers such as NOAA Public DCP Data Servers in Wallops of Virginia, LRGS DOMSAT Receive Stations, or LRGS GOES Direct Readout Ground Stations. XC DDS uses the DDS (DCP Data Service) protocol for efficiently transferring DCP data over a network.

XC DDS communicates with the LRGS servers using TCP/IP to collect DCP data from the server, to display DCP data on the screen, and to store DCP data into ASCII raw data files. It will run on 32-bit Windows operating system and retrieve or save DCP data either in periodic, real-time, or interactive mode.

These ASCII files are called Raw files that contain raw (undecoded) satellite messages. Actual decoding and processing of the messages is performed by the **XC Decode** program.

Using XCDDS

Moving around in XC DDS

The XC DDS application consists of these main areas:

- The **Menu Bar** provides access to all user-controllable functions within the application.
- The **Toolbar** provides one-click access to important functions.
- The **Status Window** provides the user with informational or error messages.
- The **Latest Message** panel displays information about the most recently received message.

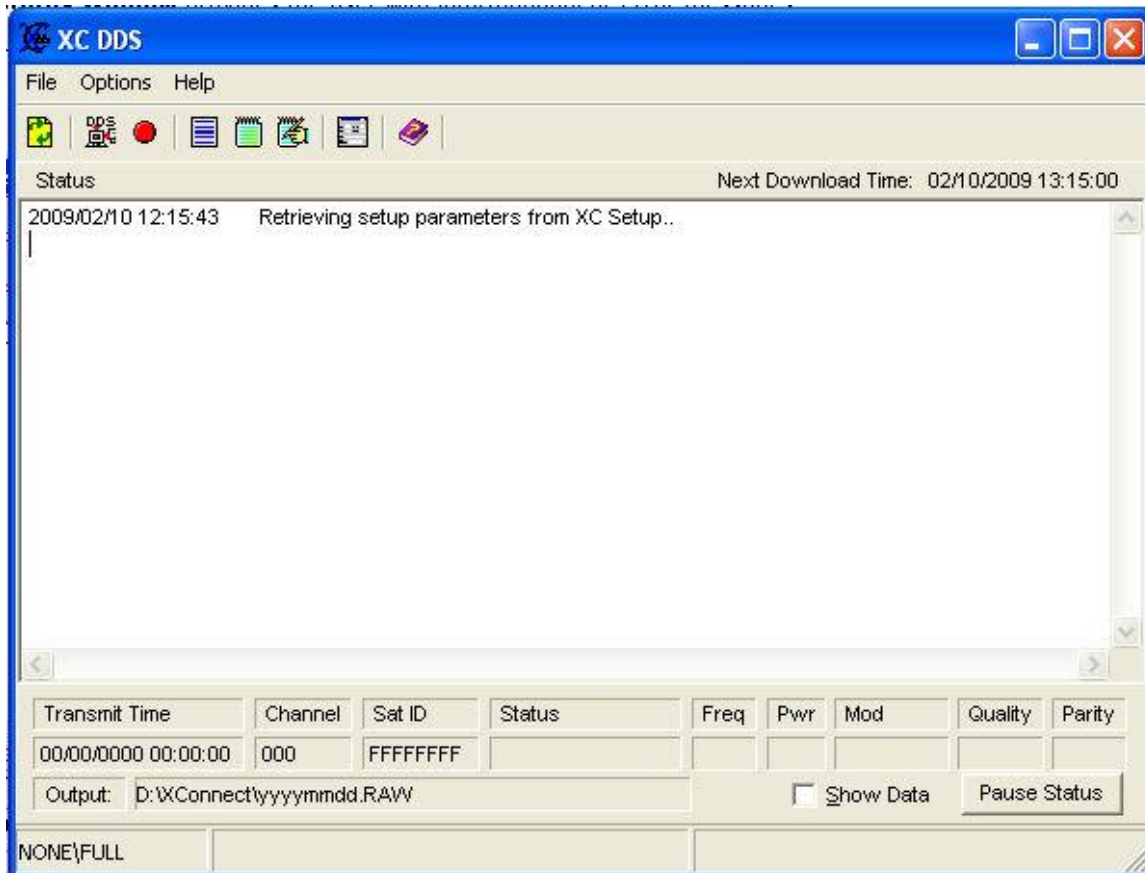


Figure 1. XC DDS main window

The Menu Bar

The Menu Bar provides access to the following menus:

File	<ul style="list-style-type: none"> ○ ReInitialize -- reloads the latest setup information from XC Setup and reinitializes the communication ports by releasing the com port and opening it with new port parameters. ○ Login -- user login for XConnect system. ○ Exit -- terminates the application.
-------------	---

Options	<ul style="list-style-type: none"> ○ Download Now -- starts a session to download satellite message immediately. ○ Stop Download -- stops current telnet session. ○ View Satellite IDs -- views and edits the satellite ID download list. ○ Detailed Status -- enables detailed status messages. ○ Log Messages -- logs all status messages to a disk file. ○ Edit Setup Parameters -- edits the setup parameters for XC DDS. ○ Clear Status Messages -- clears the status window.
Help	<ul style="list-style-type: none"> ○ DDS Help Index -- accesses this help system and defaults to Index tab. ○ DDS Help Content -- accesses this help system an defaults to Contents tab. ○ About -- get version information for this application.

The XC DDS Toolbar

The toolbar area allows you to quickly access various XC DDS functions.

The following tools are provided:



Reinitialize application. Flush local buffers and reload the latest setup information from XC Setup. Additionally, XC DDS will release the port and obtain new port information and re-open the port.



Start a telnet session to download satellite message immediately.



Stop current telnet session.



View and edit the satellite ID download list.



Show detailed status messages.



Log all status messages to a disk file.



Clear Status Messages – clear all status message information from the Status Memo.




Edit the setup parameters for XC DDS.




Open the on-line help (*this* document).


The Last Message panel

The latest message panel displays the following information about the most recently received DCP message:


- Transmit time 


The date and time of when the message was received in Greenwich Mean Time (GMT) by DDS.
- channel 


The channel the message was received on.
- satellite ID 

Satellite ID, Platform ID, NESDIS ID or DCP Address.
- status 

Status of message. Possibilities are:

 - Good - Good message
 - Short Msg - Short message received
 - Bad Chan - Message received on wrong channel
 - Parity Err - Errors in message
- frequency 

Frequency Offset in 50 Hz increments of message.
0=0-49 Hz, 1=40-99 Hz, ... 8=400-449 Hz, A=500-549 Hz
A minus sign indicates the same range only below the center frequency.
- power 

Signal Strength of received message in dB. Normal operation is 44 to 48. Reliable data can be received as low as 37 if no other signal problem exists.
- modulation 

Modulation Index or Phase Deviation.

 - N = Normal, 60 +/- 5 degrees
 - H = High, > 70 degrees
 - L = Low, < 50 degrees
- quality 

Signal to Noise quality.

 - N = Normal, error rate better than 1×10^{-6}
 - F = Fair, error rate between 1×10^{-4} and 1×10^{-6}
 - P = Poor, error rate worse than 1×10^{-4}
- parity errors 

Number of parity errors in the message.

In addition, the panel also contains the following elements:

- The name of the **Output** file where the DCP messages are being written.
- A **Show Data** Control to toggle display of satellite data in the status window.
- A **Pause** button to halt display of status messages in the status window.

The Status Window

The **Status Window** gives a list of events performed or detected by the XC DDS program.

The **Next Download Time** indicates the date and time of the next download session for DCP messages.

This list of status messages is in time order with each entry stamped with the date and time. Newest messages will appear at the top. Scroll bars will appear as needed to allow user to view parts of the display that may not fit in the window.

The Status Bar

The **Status Bar** is divided in three sections. The left-hand panel displays the user logged in and user's privileges. The middle panel displays the DDS server IP address and port number as well as the connection status. The right-hand panel displays parameter hints on the screen and also displays connection status descriptions while connecting to or disconnecting from the DDS server.

If no users are defined, the user logged in will be NONE and the privileges will be FULL. As soon as a user is defined in XC Desktop, the user and privileges displayed will be NONE and NONE.

Data Flow

Data flow in satellite systems using XC DDS is represented below.

1. XC DDS and XC Decode retrieve setup information from XC Setup.
2. XC DDS receives satellite DCP messages via a TCP/IP from the DDS server at NOAA or USGS.
3. XC DDS saves messages into Raw files.
4. XC Decode reads Raw files and processes the data based on setup and sensor information.
5. XC Decode stores data to data storage option.

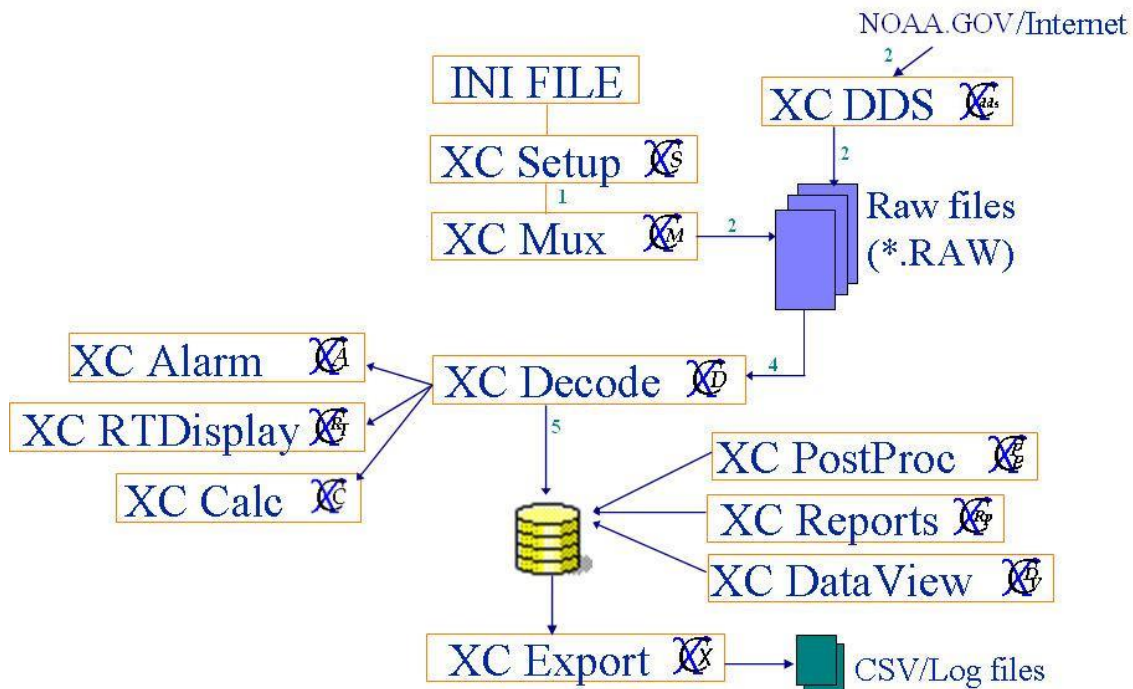


Figure 2. Data Flow
















RAW files

All messages downloaded by XC DDS are stored into raw files. **It is good practice to backup/archive all raw files on CD or tape.** Because they contained the original measured data values, they can always be re-read or re-processed by XC Decode to create any final data storage output.


If ever a new equation or rating/look up table to older data, having the original raw files allows XC Decode to apply whatever adjusted equation to the data. In many cases, the original satellite messages are transmitted in ASCII, so can easily be exchanged with other organizations to share data history.

Messages in the status window

Below are the status messages XC DDS will display in the status window as it downloads data from the DDS server:


- Connecting to xxx.xxx.xxx.xxx:port#, please wait... 
XC DDS is trying to connect to the DDS server IP address and port.
- DDS server xxx.xxx.xxx.xxx:port# is activated. 
XC DDS has activated the DDS server IP address and port which is similar to acknowledge the DDS server
- Logging into xxx.xxx.xxx.xxx:port#, please wait... 
XC DDS is logging onto the DDS server with a valid user name and password.
- Success to login to xxx.xxx.xxx.xxx:port#. 
XC DDS is successful to login to the DDS server with a valid user name and password.
- Connected to xxx.xxx.xxx.xxx:port#. 
XC DDS has connected to the DDS server after successful logging with the valid user name and password.
- Uploading search criteria, please wait... 
XC DDS is uploading the search criteria onto the DDS server.
- Search criteria successfully uploaded. 
XC DDS has successfully uploaded the search criteria on the DDS server.
- Start downloading process. 
XC DDS is going to start the downloading data process from the connected DDS server.
- Receiving DCP messages... 
XC DDS is receiving the DCP messages from the DDS server. This status message only shows up when Show Data check box is unchecked.
- Downloading process is completed. 
XC DDS has completed the downloading DCP data messages from the DDS server.
- Disconnecting from server... 
XC DDS is sending the request to disconnect from the DDS server.
- DDS server xxx.xxx.xxx.xxx:port# is disconnected. 
XC DDS has disconnected from the DDS server.
- Sending stop command. 
XC DDS is sending a STOP command to the DDS server to stop retrieving the DCP messages.
- IP address or Port number is empty! 
User hasn't entered the IP address and port number for the DDS server. Go to the Edit Setup Parameters window and type in the IP address and port number there.
- Waiting for next retry. Press Stop to abort. 

XC DDS is waiting to retry to activate the current IP address and port number or next available IP address and port number.

- User forced to disconnect from the DDS server. 
User forces the XC DDS to disconnect from the DDS server.

On-demand download


XC DDS will automatically download satellite messages from DDS based on the **Base Time** and **Interval**. However, if the user does not want to wait for the [Next Download Time](#) as displayed in the main status window, the user can force the next decoding cycle. To trigger an on-demand decoding interval:

1. Click the **XC DDS** icon on the desktop. The XC DDS application starts minimized.
2. From the **Options** menu, select **Download Now** or from the toolbar click on the  icon.

Viewing satellite IDs

XC DDS only downloads messages for satellite IDs for stations defined in XC Desktop. The user can modify the order of the download list or remove satellite IDs from the download list. As an example, all the station may have been configured in XC Desktop, in advance, but the station may not be physically installed and transmitting. In this case, the user may want to remove stations from the download list.

To view or edit the satellite ID list:

1. Click the **XC DDS** icon on the desktop. The XC DDS application will start minimized.
2. From the **Options** menu, select **View Satellite IDs** or click the  button on the toolbar.
3. The Satellite Download List window will appear. ▶

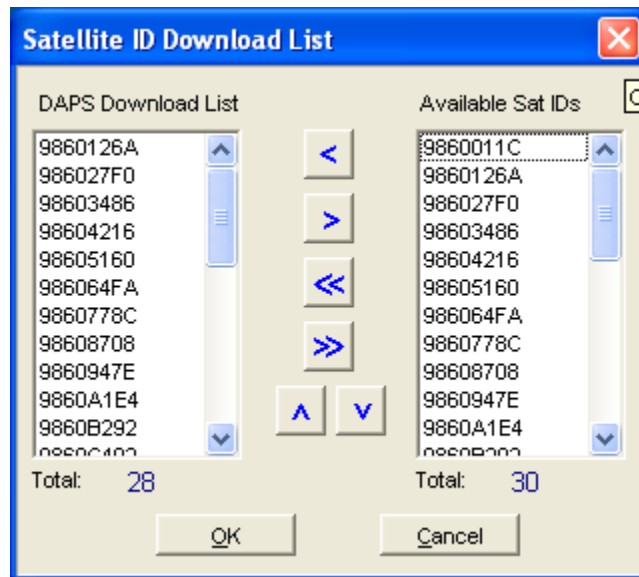



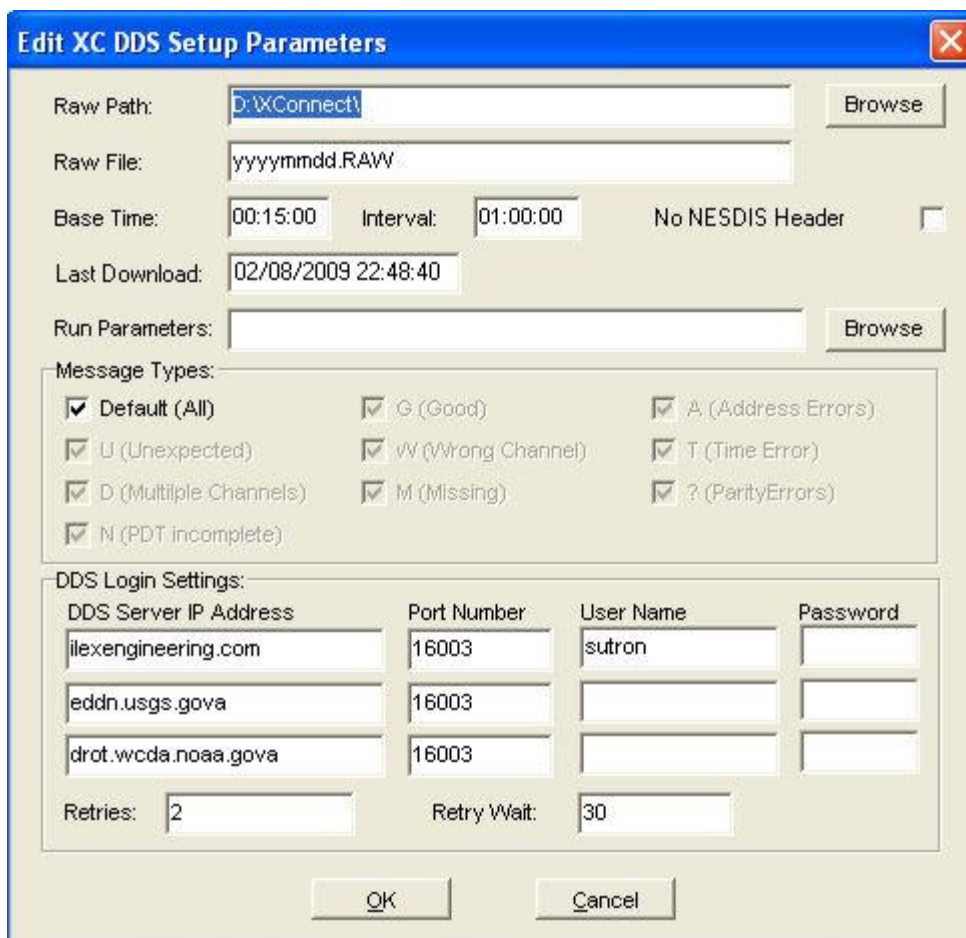
Figure 3. Satellite ID Download list

The satellite IDs listed on left hand side represent the IDs that will be in DDS download list. The list on the right-hand side represent all the satellite IDs for all the station defined in XC Desktop. Use the arrows to modify the order of the DDS download list or remove IDs from the list.

Editing setup parameters

In order to receive DCP messages, there are a number of critical parameters that must be properly configured within XC DDS. To set these parameters:

1. Click the **XC DDS** icon on the desktop. The XC DDS application will start minimized.
2. From the **Options** menu, select **Edit Setup Parameters** or from the toolbar click the  button.
3. The **Edit DDS Setup Parameters** window appears. ▶



Edit XC DDS Setup Parameters

Raw Path: Browse

Raw File:

Base Time: Interval: No NESDIS Header

Last Download:

Run Parameters: Browse

Message Types:

Default (All) G (Good) A (Address Errors)

U (Unexpected) W (Wrong Channel) T (Time Error)

D (Multiple Channels) M (Missing) ? (Parity Errors)

N (PDT Incomplete)

DDS Login Settings:

DDS Server IP Address	Port Number	User Name	Password
<input type="text" value="ilexengineering.com"/>	<input type="text" value="16003"/>	<input type="text" value="sutron"/>	<input type="text"/>
<input type="text" value="eddn.usgs.gov"/>	<input type="text" value="16003"/>	<input type="text"/>	<input type="text"/>
<input type="text" value="drot.wcda.noaa.gov"/>	<input type="text" value="16003"/>	<input type="text"/>	<input type="text"/>

Retries: Retry Wait:

OK Cancel

Figure 4. XC DDS setup parameters

From this window you can make changes to the DDS setup as described below. When you are finished, click the **OK** button to save changes. Changes will be saved to XC Setup. Clicking **Cancel** will close the window without saving changes.

This parameters are the same as viewed and edited in XC Desktop - XC DDS Setup window. The user has the option to edit the parameters within XC DDS or in XC Desktop.

XC DDS Setup Parameters

- **Raw Path** - The directory to store the raw DCP message files as the satellite messages downloaded from DDS Server.

- **Raw File** - The naming pattern of the raw data output files. The pattern contained in this field determines the name of the file which XC DDS will create and/or append to as messages are received from DDS. Tips on [raw file naming convention](#). 

The lower case letters "yy", "yyyy", "mm", "dd", "hh", "mi" can be included in the name to instruct the software to create separate minute, hourly, daily, monthly, or yearly files. Optionally, "#nn": can be added to specify that a new file should be created every nn minutes (when using "mi") or hours (when using "hh"), or days (all other). The "#nn" can appear anywhere in the string, where nn must be two digits with leading zeros, if necessary.

The dating of raw files is important for easy backup, purging or distribution of raw data; and reprocessing of raw data through XC Decode. If the files are allowed to grow too large, these processes will become more difficult or require excessive time to perform. The default setting of yyyyymmdd.RAW creates a separate file each day.


Example 1:

MYDATdd.RAW would create the file MYDAT01.RAW on the first day of the month, MYDAT02.RAW on the second day, and so on until the next month MYDAT01 would be used again. NESmm.RAW would create the file NES01.RAW to contain all the data for January, NES02.RAW to contain all the data for February, and so on until the next month.

Example 2:

yymmddhh.RAW#02 would create a new output file every 2 hours. If the "#02" was left off, a new file would be created every hour. As well, mmddhhmi.RAW#15 would create a new output file every 15 minutes.

- **Base Time** - Used in conjunction with the Interval, this indicates how often XC DDS will login to the DDS server and download satellite messages into raw files. Base Time represents an offset into the hour. As an example, if the Base Time is 00:05:00 and Interval is 00:30:00, then XC DDS will check for messages at 00:05:00, 00:35:00, 01:05:00, 01:35:00...etc.
- **Interval** - Used in conjunction with the Base Time, this indicates how often XC DDS will login to the DDS server and download satellite messages into raw files. Base Time represents an offset into the hour. As an example, if the Base Time is 00:05:00 and Auto Interval is 00:30:00, then XC DDS will check for messages at 00:05:00, 00:35:00, 01:05:00, 01:35:00...etc.
- **No NESDIS Header** - Check this flag if you would prefer to strip off the NESDIS header (first 37 characters) from the satellite message before storing to the raw file. This flag is rarely used. This may be useful if the transmitted message is a complete formatted text message (i.e. WMO message) that just needs to be stored to disk.
- **Last Download** - Timestamp of last satellite message downloaded by XC DDS. XC DDS will update this field each time a messages from a satellite id are stored. XC DDS will track the last download times from all the satellite ids and save the earliest of all the download times as the Last Download time. The Last Download time will be the start time for the next download cycle. The time is GMT like the DDS server.
- **Run Parameters** - An optional list of programs to run when the XC DDS program is started. These programs will be started before XC DDS begins processing messages. If the application does not reside in the XConnect home directory, list the file path with the executable name (i.e., c:\myapp\myapp.exe).


 As an example, a custom client program may used to display decoded data in a specific layout. To ensure the client program is automatically running when XC Decode starts, add the client program executable name to the Run parameter list.

- **Message Types**
 - **Default** - Download all messages in DDS server for satellite id.

- **Good (G)** - Download good DCP messages.
- **Address Errors (A)** - Download messages issued by DDS with address errors. Address errors can sometimes be correctable by DDS.
- **Missing (M)** - Download messages issued by DDS flagging missing messages.
- **Unexpected (U)** - Download messages issued by DDS flagging unexpected messages.
- **Wrong Channel (W)** - Download messages issued by DDS flagging messages received on the wrong channel.
- **Time Error (T)** - Download messages issued by DDS flagging transmit time errors.
- **PDT Incomplete (P)** - Download messages issued by DDS flagging incomplete PDT records.
- **Multiple Channels (D)** - Download messages issued by DDS flagging messages received on multiple channels.
- **Parity Errors (?)** - Download DCP messages with parity errors.
- **DDS Login Settings**
 - **DDS Server IP Address** - User can enter up to three IP addresses. Each IP address points to a specific DDS server. Consult NOAA or USGS for a certain IP address. The first IP address is the primary DDS server IP address, which user frequently downloads DCP messages from. The second and third IP addresses are the alternative DDS server IP addresses which can be used as the backup DDS servers once the primary DDS server is shut down.
 - **Port Number** - Each port number links with its related IP address. The default port number is 16003.
 - **User name** - The User Name is used to log into a DDS server with the related IP address and Port Number. Normally the user name is issued by NOAA or USGS who provides the DDS services.
 - **User password** - The Password is used to log into a DDS server.
 - **Retries** - Number of times to retry to connect to a DDS server once failed. The default value is 2.
 - **Retry Wait** - The seconds to wait between retries. The default value for this parameter is 60.


Logging status messages

The purpose of the **Log Status messages** is more for troubleshooting. Logging all messages will provide Sutron customer support as a historical log of all events to help troubleshoot any problems. To log all status messages:


1. Click the **XC DDS** icon on the desktop. The XC DDS will start minimized.
2. From the **Options** menu, select **Log Status Messages** or from the toolbar click on the  icon. The user will be required to enter/select the name of the file to store the status messages.


Clearing the status window

The purpose of the status window is for XC DDS to display the informational and warning messages. To clear the window of existing messages:

1. Click the **XC DDS** icon on the desktop. The XC DDS application will start minimized.
2. From the **Options** menu, select **Clear Status Messages** or from the toolbar click on the  icon.

Refreshing Setup parameters

XC DDS gets the configuration data it needs from the XC Setup program. Since most of this information is requested at application startup, there needs to be a mechanism for propagating changes that are made to the setup after XC DDS is already running. This mechanism is provided via the **Reinitialize**  function which can be found in XC DDS on the toolbar or under the **File** menu.

Clicking the **Reinitialize**  button causes XC DDS to flush the current setup information from its buffer and request new setup information from XC Setup. In addition, XC DDS will also release (close) its IP socket port and then open a port using the new IP specified in the newly refreshed setup information.

Advanced Topics

NESDIS Header and Message Description

CE12265402365235959G46-3NN052WFF00029@DEAap@JAAap@JAAap@JAgri□

1 2 3 4 5 6 7 8 9 ABC DE F G H

Field #	Byte Length	Range	Description
1	8	0-9,A-F	Satellite ID (also referred as: Platform ID, NESDIS ID, DCP Address)
2	2	00-99	Year message was received relative to GMT/UCT
3	3	000-365	Julian day message was received relative to GMT/UCT
4	2	00-23	Hour message was received relative to GMT/UCT
5	2	00-59	Minute message was received relative to GMT/UCT
6	2	00-59	Second message was received relative to GMT/UCT
7	1	G,?,W,A,B,T,U, M,I,N,Q,C,S	<p>Failure Code</p> <p>G - Good Message</p> <p>? - Message received with parity errors</p> <p>M - Missing message</p> <p>S - Short or Truncated message (Sutron Only)</p> <p>THE FOLLOWING CODES ARE USED BY NESDIS ONLY:</p> <p>W - Message received on wrong channel</p> <p>D - Message received on multiple channel (duplicate)</p> <p>A - Message received with address error(s) (correctable)</p> <p>B - Message received with bad address (not correctable)</p> <p>T - Message received late/early (time error)</p> <p>U - Unexpected message</p> <p>I - Invalid address</p> <p>N - PDT entry for platform not complete</p> <p>Q - Bad quality measurements</p> <p>C - Comparison error on test transmission</p> <p>Note: The PDT is NESIDS's platform description table.</p>
8	2	32-57	Signal Strength of received message in dB. Normal operation is 44-48. Reliable data can be received as low as 37 if no other signal problem exists.
9	2	0,1,2...9,A -1,-2...-9,-A	<p>Frequency Offset in 50 Hz increments.</p> <p>0=0-49 Hz, 1=40-99 Hz,...8=400-449 Hz, A=500-549 Hz.</p> <p>A minus sign indicates the same range only below the center frequency.</p>
A	1	N,H,L	<p>Modulation Index or Phase Deviation</p> <p>N = Normal, 60 +/- 5 degrees</p> <p>H = High, > 70 degrees</p> <p>L = Low, < 50 degrees</p>
B	1	N,H,P	<p>Modulation Quality</p> <p>N = Normal, error rate better than 1×10^{-6}</p> <p>F = Fair, error rate between 1×10^{-4} and 1×10^{-6}</p> <p>P = Poor, error rate worse than 1×10^{-4}</p>

C	3	000-999	Channel message was received on
D	1	E,W,C,A	Satellite Spacecraft Location E - GOES East W = GOES West C = GOES Central (not currently used) THE FOLLOW CODES HAVE BEEN DEFINED BY SUTRON TO SUPPORT NON-GOES SATELLITES: A = ARGOS (Never see this from NESDIS)
E	2	FF	Uplink carrier status (not used, always FF)
F	5	00000-15750	Message Data Length (plus 4 bytes to account for satellite ID which used to be contained in the message + 1 byte for the EOT stored as a blank space at the end). In the example, there are acutally only 24 bytes of data, however, 24+4+1 or 29 is the actual number stored in the data length.
G	Message Data Length minus 5	!~\,CR,LF,SPACE	Message data. Can be continued on multiple lines separated by a CR and a LF.
H	1	□	Blank space representing EOT (End of Transmission) at end of message.

Sutron transmission format

Sutron Satellite Transmission format

The Sutron dataloggers support 4 different transmission formats, they are:

1. [Random Binary](#) (6-bit binary code)
2. [Self Timed Binary Interleaved](#) (6-bit binary code)
3. [Self Timed ASCII SHEF](#) (Standard Decimal Format, similar to SHEF)
4. [Self Timed Binary Non-Interleaved](#) (6-bit binary code - XPERT/XLITES only)

Below is first describes the general transmission format followed by details on each of the formats transmitted by the Sutron dataloggers.

RANDOM BINARY DATA FORMAT

This format is used when the Sutron RTU makes a random or alarm transmission. The format of the transmission data is:

```
<GROUP-ID> <OFFSET>
<SENSOR1-DATA> <SENSOR2-DATA> ... <SENSOR(N)-DATA>
<SENSOR1-DATA> <SENSOR2-DATA> ... <SENSOR(N)-DATA>
<SENSOR1-DATA> <SENSOR2-DATA> ... <SENSOR(N)-DATA>
...
<EXTERNAL DATA><COUNTER><BATTERY><LAT/LONG>
```

where:

GROUP-ID	The GROUP-ID is a one byte character, in the range 2 to 9, indicating the random group which caused the transmission.
OFFSET	OFFSET is a 1 byte binary encoded number indicating the number of minutes ago the most recent data was recorded.
SENSOR-DATA	<p>The actual SENSOR-DATA contains only those sensors belonging to the random group which caused the alarm. The data values are 3 byte binary encoded signed numbers allowing a range of: -131072 to +131071. The actual 6-bit binary encoded format is described later. The Sutron RTU will only transmit numbers in the range -32768 to +32767. The value transmitted is taken directly from the log of the Sutron RTU which was scaled by Rightdigits before being placed in the log. The value transmitted will be value * 10^{RightDigits}. The string "///" will be sent if the data was never recorded or was erased.</p> <p>For 8200/8210 data loggers, the number of sensors values transmitted depends on the number of sensors in the random group, and the number of log records sent depends on #Data/TX RR selected in the Sutron RTU. The most recent data is always sent first. Note: if #Measmnt/Log is set > 1, the first value transmitted is the last measured value, not the last logged value. This has been done to support users who want data logged hourly (to conserve space) and still transmit randomly a value collected more often. Since the number of values transmitted for each sensor is the same, the values are interleaved (a set of sensors values are transmitted at a time).</p>

	<p>For XPert/XLite/SatLink data loggers, the number of sensor values is set separately for each measurement in the Random Transmissions, Num values to Tx field. As a result, the Satlink will send all the required values for one sensor (most recent first) before proceeding to the next sensors. These values are non-interleaved.</p>
EXTERNAL DATA	<p>For SatLink data loggers only, this is data given to the SatLink by a device through the RS-232 port. This is untouched by the SatLink Logger. It gets transmitted in the same way it was received.</p>
LAT/LOG	<p>For data loggers using SatLink transmitters only, this is an optional field. It will only be included if the Append Lat/Long parameter is selected for random transmissions. XConnect cannot decode LAT/LONG.</p> <p>LAT/LONG can manually be decoded into D:M:S format by converting the binary values to decimal and applying the following formula:</p> <ul style="list-style-type: none"> Degrees latitude = $64 * (1\text{st-byte AND } 63) + (2\text{nd-Byte AND } 63) - 180$. Minutes latitude = 3rd-byte AND 63 Seconds latitude = 4th-byte AND 63. Degrees longitude = $64 * (5\text{th -byte AND } 63) + (6\text{th -Byte AND } 63) - 180$. Minutes longitude = 7th-byte AND 63 Seconds longitude = 8th-byte AND 63. For example BAAODAXe would be decoded as Lat N 39o 1' 15.79" Long W 77o 24' 37.19".
COUNTER	<p>COUNTER is a 2 byte binary encoded number which indicates the transmission number and increments after every transmission. The number will be between 0 and 4095.</p>
BATTERY	<p>BATTERY is a 1 byte binary encoded number representing the battery voltage of the Sutron RTU before the transmission. The range of the number will be -32 to +31 and can be converted to volts by multiplying by 0.234 and adding 10.6 allowing a range of 3.1 to 18.1 volts.</p>

EXAMPLE 1:

Here is a message with 2 data items per transmission and with three sensors enabled in random group 2.

This message assumes that #measmt/log = 1.

```
2@@Gt@Sx@@i@Gs@Sr@@i@GI
```

```

||| | | | | | |
||| | | | | | | +- Battery voltage
||| | | | | | +--- Random Counter
||| | | | | +----- Temp #2
||| | | | +----- Precip #2
||| | | +----- Stage #2
||| | +----- Temp #1
||| +----- Precip #1
||+----- Stage #1
|+----- Delta Time

```

+----- Group ID

The time stamp for the values is based on DatTimRR and DatIntRR. A transmission made at 10:28 would have the 10:15 (#1) and 10:00 (#2) data if DatTimRR=00:00:00 and DatIntRR=00:15:00. If DatTimRR=00:00:00 and DatIntRR=01:00:00 the data would be at 10:00 (#1) and 9:00 (#2)

EXAMPLE 2:

If #measmnt/log were > 1, the message would appear as follows:

Here is a message with 2 data items per transmission and with three sensors enabled in random group 2:

```
2@@Gt@Sx@@i@Gs@Sr@@i@GI
||| | | | | | | |
||| | | | | | | +- Battery Voltage
||| | | | | | +--- Random Counter
||| | | | | +----- Temp #1 (based on DatTimRR and DatIntRR)
||| | | | +----- Precip #1 (based on DatTimRR and DatIntRR)
||| | | +----- Stage #1 (based on DatTimRR and DatIntRR)
||| | +----- Temp #1 (last measured value)
||| +----- Precip #1 (last measured value)
||+----- Stage #1 (last measured value)
|+----- Offset Time
+----- Group ID
```

EXAMPLE 3:

```
2@@Gt@Gs@Sx@Sr@@i@@iEXTBAAODAXe@GI
||| | | | | | | | |
||| | | | | | | | +- Battery Voltage
||| | | | | | | | +--- Random Counter
||| | | | | | | +----- Latitude/Longitude (optional)
||| | | | | | +----- External Data (EXT given by external RS-232
device)
||| | | | | +----- Temp #2
||| | | | +----- Temp #1
||| | | +----- Precip #2
||| | +----- Precip #1
||| +----- Stage #2
||+----- Stage #1
|+----- Delta Time
+----- Group ID = 2
```

The time stamp for these values is a bit different than that in the first example. In this later case, the Sutron RTU sends the last measured value for each sensor first. The time stamp for these sensors would be the last nearest measurement time. The first data from the log (#1) would have the same time stamp as before.

SELF TIMED BINARY INTERLEAVED DATA FORMAT

This format is used when the Sutron RTU makes a self-timed transmission and the format has been set to BINARY. The format of the transmission data is:

```
<BLOCK-IDENTIFIER> <GROUP-ID> <OFFSET>
<SENSOR1-DATA> <SENSOR2-DATA> ... <SENSOR(N)-DATA>
<SENSOR1-DATA> <SENSOR2-DATA> ... <SENSOR(N)-DATA> ...
<SENSOR1-DATA> <SENSOR2-DATA> ... <SENSOR(N)-DATA>
<EXTERNAL DATA><COUNTER><BATTERY><LAT/LONG>
```

where:

BLOCK-IDENTIFIER	BLOCK-IDENTIFIER is always sent as "B" to indicate the start of a binary data group.
GROUP-ID	GROUP-ID is always sent as "1" to indicate the self timed group.
OFFSET	After the group id, the actual data from the Sutron RTU's log are sent. Each record is prefixed with an <OFFSET>, which is a 1 byte binary encoded number indicating the number of minutes ago the most recent data was recorded.
SENSOR-DATA	<p>SENSOR-DATA contains only those sensors belonging to the self timed group (number 1). The data values are 3 byte binary encoded signed numbers allowing a range of: -131072 to +131071. The actual 6-bit binary encoded format is described later. The Sutron RTU will only transmit numbers in the range -32768 to +32767. The value transmitted is taken directly from the log of the Sutron RTU which was scaled by RightDigits before being placed in the log. The value transmitted will be value * 10^{RightDigits}. The string "///" will be sent if the data was never recorded or was erased.</p> <p>For 8200/8210 data loggers, the number of sensors values transmitted depends on the number of sensors in the random group, and the number of log records sent depends on #Data/TX ST selected in the Sutron RTU. The most recent data is always sent first. Note: if #Measmnt/Log is set > 1, the first value transmitted is the last measured value, not the last logged value. This has been done to support users who want data logged hourly (to conserve space) and still transmit randomly a value collected more often. Since the number of values transmitted for each sensor is the same, the values are interleaved (a set of sensors values are transmitted at a time).</p>
EXTERNAL DATA	For SatLink data loggers only , this is data given to the SatLink by a device through the RS-232 port. This is untouched by the SatLink Logger. It gets transmitted in the same way it was received.
BATTERY	BATTERY is a 1 byte binary encoded number representing the battery voltage of the Sutron RTU before the transmission. The range of the number will be -32 to +31 and can be converted to volts by multiplying by 0.234 and adding 10.6 allowing a range of 3.1 to 18.1 volts.
LAT/LONG	<p>For data loggers using SatLink transmitters only, this is an optional field. It will only be included if the Append Lat/Long parameter is selected for random transmissions. XConnect cannot decode LAT/LONG.</p> <p>LAT/LONG can manually be decoded into D:M:S format by converting the binary values to decimal and applying the following formula:</p>

- Degrees latitude = 64 * (1st-byte AND 63) + (2nd-Byte AND 63) - 180.
- Minutes latitude = 3rd-byte AND 63Seconds latitude = 4th-byte AND 63.
- Degrees longitude = 64 * (5th -byte AND 63) + (6th -Byte AND 63) - 180.
- Minutes longitude = 7th-byte AND 63Seconds longitude = 8th-byte AND 63.
- For example BAAODAXe would be decoded as Lat N 39o 1' 15.79" Long W 77o 24' 37.19".

EXAMPLE 1:

Here is a message with 2 data items per transmission and with three sensors enabled in the self-timed group:

```
B1@@gt@sx@@i@gS@Sr@@iI
|||| | | | | +--- Battery Voltage
|||| | | | | +----- Temp #2
|||| | | | +----- Precip #2
|||| | | +----- Stage #2
|||| | +----- Temp #1
|||| +----- Precip #1
|||+----- Stage #1
||+----- Delta Time
|+----- Group ID
+----- Block ID
```

SELF TIMED BINARY NON-INTERLEAVED DATA FORMAT

This format is used when the XPERT/XLITE makes a self-timed transmission and the format has been set to BINARY/NON-INTERLEAVED. The format of the transmission data is:

```
<BLOCK-IDENTIFIER> <GROUP-ID> <OFFSET>
<SENSOR1-DATA> <SENSOR1-DATA> ... <SENSOR1-DATA>
<SENSOR2-DATA> <SENSOR2-DATA> ... <SENSOR2-DATA> ... <SENSOR2-DATA>
<SENSOR(N)-DATA> <SENSOR(N)-DATA>
<BATTERY>
```

where:

BLOCK-IDENTIFIER	BLOCK-IDENTIFIER is always sent as "B" to indicate the start of a binary data group.
GROUP-ID	GROUP-ID is always sent as "1" to indicate the self timed group.
OFFSET	After the group id, the actual data from the Sutron RTU's log are sent. Each record is prefixed with an <OFFSET>, which is a 1 byte binary encoded number indicating the number of minutes ago the most recent data was

	recorded.
SENSOR-DATA	<p>SENSOR-DATA contains only those sensors belonging to the self timed group (number 1). The data values are 3 byte binary encoded signed numbers allowing a range of: -131072 to +131071. The actual 6-bit binary encoded format is described later. The Sutron RTU will only transmit numbers in the range -32768 to +32767. The value transmitted is taken directly from the log of the Sutron RTU which was scaled by RightDigits before being placed in the log. The value transmitted will be value * 10^RightDigits. The string "///" will be sent if the data was never recorded or was erased.</p> <p>For XPert/XLite/SatLink data loggers, the number of sensor values is set separately for each measurement in the Scheduled Transmissions, Num values to Tx field. As a result, the Satlink will send all the required values for one sensor (most recent first) before proceeding to the next sensors. These values are non-interleaved.</p>
BATTERY	<p>BATTERY is a 1 byte binary encoded number representing the battery voltage of the Sutron RTU before the transmission. The range of the number will be -32 to +31 and can be converted to volts by multiplying by 0.234 and adding 10.6 allowing a range of 3.1 to 18.1 volts.</p>
LAT/LONG	<p>For data loggers using SatLink transmitters only, this is an optional field. It will only be included if the Append Lat/Long parameter is selected for random transmissions. XConnect cannot decode LAT/LONG.</p> <p>LAT/LONG can manually be decoded into D:M:S format by converting the binary values to decimal and applying the following formula:</p> <ul style="list-style-type: none"> Degrees latitude = 64 * (1st-byte AND 63) + (2nd-Byte AND 63) - 180. Minutes latitude = 3rd-byte AND 63Seconds latitude = 4th-byte AND 63. Degrees longitude = 64 * (5th -byte AND 63) + (6th -Byte AND 63) - 180. Minutes longitude = 7th-byte AND 63Seconds longitude = 8th-byte AND 63. For example BAAODAXe would be decoded as Lat N 39o 1' 15.79" Long W 77o 24' 37.19".

EXAMPLE 1:

Here is a message with three sensors enabled each with a different number of data items in the selftimed group:

B1@Gt@Gs@Sx@Sr@@i@@iEXTIBAAODAXe

```

|||| | | | | | | |
|||| | | | | | | | +----- Latitude/Longitude (optional)
|||| | | | | | | +----- Battery Voltage (optional)
|||| | | | | | +----- External
|||| | | | | +----- Temp #2
|||| | | | +----- Temp #1
|||| | | +----- Precip #2
    
```

```

|||| | +----- Precip #1
|||| +----- Stage #2
|||+----- Stage #1
||+----- Delta Time
|+----- Group ID
+----- Block ID
    
```

SELF TIMED ASCII SHEF DATA FORMAT

This format is used when the Sutron RTU makes a self-timed transmission and the format has been set to SHEF. The format of the transmission data is:

```

":" <NAME1> <OFFSET> "#"<INTERVAL> <DATA1> <DATA1> ... <DATA1>
":" <NAME2> <OFFSET> "#"<INTERVAL> <DATA2> <DATA2> ... <DATA2> ...
":" <NAME(N)> <OFFSET> "#"<INTERVAL> <DATA(N)> <DATA(N)> ... <DATA(N)>
":" <EXTERNAL DATA>
":" <BATTERY-NAME> <OFFSET> <BATTERY>
<LAT/LONG>
    
```

where:

NAME	NAME is the sensor name or SHEF CODE as entered in the Sutron RTU in the enable sensor menu. SHEF CODES are usually two digit codes and you will have to look up the appropriate codes for your sensors. So, for instance the SHEF CODE for gage height is HG, cumulative precipitation is PC, air temperature is TA, and battery voltage is VB.
OFFSET	OFFSET After the group id, the actual data from the Sutron RTU's log are sent. Each record is prefixed with an <OFFSET>, which is an ASCII number indicating the number of minutes ago the most recent data was recorded.
INTERVAL	INTERVAL indicates the interval in minutes between transmitted sensor data items. The Sutron RTU always uses the same interval for every sensor. The interval is called the Data Interval in the Sutron RTU GOES setup menu.
SENSOR-DATA	<p>Unlike the binary formats, the SHEF format groups all the related sensor <DATA> together. So, the data line for precipitation would contain the most recent precip data first followed by the next oldest, etc. One entry is generated for each sensor in the self timed group (number 1). The data is transmitted in ASCII with sign and decimal point (if needed). If a data value has not yet been recorded (or has been erased) the letter "M" for missing data will be sent.</p> <p>The number of sensors transmitted depends on the number of sensors in the self timed group, and the number of log records sent depends on the Number of Data Items selected in the Sutron RTU. The most recent data is always sent first.</p>
EXTERNAL DATA	For SatLink data loggers only , this is data given to the SatLink by a device through the RS-232 port. This is untouched by the SatLink Logger. It gets transmitted in the same way it was

	received.
BATTERY	After all of the sensors and data have been sent on last entry will be transmitted containing the battery voltage. <BATTERY-NAME> will contain the SHEF code assigned to Battery voltage in the Sutron RTU. <OFFSET> will be the same as for other entries and <BATTERY> will contain the Sutron RTU battery voltage as measured just before transmitting.
LAT/LONG	<p>For data loggers using SatLink transmitters only, this is an optional field. It will only be included if the Append Lat/Long parameter is selected for random transmissions. XConnect cannot decode LAT/LONG.</p> <p>LAT/LONG can manually be decoded into D:M:S format by converting the binary values to decimal and applying the following formula:</p> <ul style="list-style-type: none"> • Degrees latitude = 64 * (1st-byte AND 63) + (2nd-Byte AND 63) - 180. • Minutes latitude = 3rd-byte AND 63Seconds latitude = 4th-byte AND 63. • Degrees longitude = 64 * (5th -byte AND 63) + (6th -Byte AND 63) - 180. • Minutes longitude = 7th-byte AND 63Seconds longitude = 8th-byte AND 63. • For example BAAODAXe would be decoded as Lat N 39o 1' 15.79" Long W 77o 24' 37.19".

EXAMPLE:

Here is a message with 2 data items per transmission and with three sensors enabled in the selftimed group, notice how much longer this message is compared to the earlier binary examples:

```

:HG 0 #15 10.20 10.15 :PC 0 #15 50 49 :TA 0 #15 -22.1 -22.0 :VB 0 12.2
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | +- VB reading
| | | | | | | | | | | | | | | | | | | | + -- Offset time
| | | | | | | | | | | | | | | | | | | | +----- Sensor Name, VB
| | | | | | | | | | | | | | | | | | | | +----- TA #2
| | | | | | | | | | | | | | | | | | | | +----- TA #1
| | | | | | | | | | | | | | | | | | | | +----- Interval
| | | | | | | | | | | | | | | | | | | | +----- Offset time
| | | | | | | | | | | | | | | | | | | | +----- Sensor Name, TA
| | | | | | | | | | | | | | | | | | | | +----- PC #2
| | | | | | | | | | | | | | | | | | | | +----- PC #1
| | | | | | | | | | | | | | | | | | | | +----- Interval
| | | | | | | | | | | | | | | | | | | | +----- Offset time
| | | | | | | | | | | | | | | | | | | | +----- Sensor Name, PC
| | | | | | | | | | | | | | | | | | | | +----- HG #2
| | | | | | | | | | | | | | | | | | | | +----- HG #1
    
```

```

| | +----- Interval
| +----- offset time
+----- Sensor Name, HG

```

Note: the names HG, PC, TA are the sensor names assigned by the person setting up the Sutron RTU. If the default names are used they might be Encoder1 (HG), Counter (PC), Analog1 (TA), Battery (VB).

SIX-BIT BINARY ENCODED FORMAT

The six bit binary format is used to encode numbers into displayable ASCII characters. Notice that fractional numbers cannot be represented, so for instance a battery voltage of 13.04 volts setup with 2 right digits will be sent as 1304.

- A 1 byte encoded number can range from -32 to +31.
- A 2 byte encoded number can range from -2048 to +2047
- A 3 byte encoded number can range from -131072 to +131071

Binary encoded numbers are always sent most significant bytes first. The number itself is broken down into 6-bit digits, and each digit is placed in one byte of data. The number 64 (ASCII "@") is added to each digit to make it fall within the range of displayable ASCII characters. The only exception is that 127 (ASCII) is sent as 63 (ASCII "?")

Example 1. Encoding the number 10 in 1 byte:

- Since 10 will fit in 6-bits we only have to add 64 which would yield 74. So the number 10 would appear as ASCII 74 or the letter "J".

Example 2. Encoding the number 12345 in 3 bytes:

- First we have to convert 12345 into binary in 6-bit pieces:
12345 (base 10) = 11 000000 111001 (base 2)
- Now we can convert each piece back to base 10:
11 000000 111001 (base 2) = 3, 0, 57
- Finally, we add 64 to each piece and convert to ASCII:
67, 64, 121 = ASCII "C@y"

Example 3. Encoding the number -12345 in 3 bytes:

- First we have to convert -12345 into two's complement 18-bit binary:
-12345 (base 10) = 111100 111111 000111 (base 2)
- Now we can convert each piece back to base 10:
111100 111111 000111 (base 2) = 60, 63, 7
- Finally, we add 64 to each piece and convert to ASCII (since the second piece is 63 we leave it alone):
124, 63, 71 = ASCII "|?G"

Example 4. Decoding the 3 byte string "@SW":

This is just like encoding except we follow the steps backwards.

- First we convert all the characters to ASCII decimal codes:
ASCII "@SW" = 64, 83, 87
- Now we subtract 64 from each piece and convert to 6 bit binary:
0, 19, 23 = 000000 010011 010111
- Finally, we combine all the bits to form one 18-bit twos complement number and convert to base 10:
000000010011010111 = 1239

DDS Server Error Codes

The table below describes the currently defined error codes.

Name	Code	Description
DSUCCESS	0	
DNOFLAG	1	Could not find start of message flag.
DDUMMY	2	Message found (and loaded) but it's a dummy.
DLONGLIST	3	Network list was too long to upload.
DARCERROR	4	Error reading archive file.
DNOCONFIG	5	Cannot attach to configuration shared memory
DNOSRCHSHM	6	Cannot attach to search shared memory
DNODIRLOCK	7	Could not get ID of directory lock semaphore
DNODIRFILE	8	Could not open message directory file
DNOMSGFILE	9	Could not open message storage file
DDIRSEMERR	10	Error on directory lock semaphore
DMSGTIMEOUT	11	Timeout waiting for new messages
DNONETLIST	12	Could not open network list file
DNOSRCHCRIT	13	Could not open search criteria file
DBADSINCE	14	Bad since time in search criteria file
DBADUNTIL	15	Bad until time in search criteria file
DBADNLIST	16	Bad network list in search criteria file
DBADADDR	17	Bad DCP address in search criteria file
DBADEMAIL	18	Bad electronic mail value in search criteria file
DBADRTRAN	19	Bad retransmitted value in search criteria file
DNLISTXCD	20	Number of network lists exceeded
DADDRXCD	21	Number of DCP addresses exceeded
DNOLRGSLAST	22	Could not open last read access file
DWRONGMSG	23	Message doesn't correspond with directory entry
DNOMOREPROC	24	Can't attach: No more processes allowed
DBADDAPSSTAT	25	Bad DAPS status specified in search criteria.
DBADTIMEOUT	26	Bad TIMEOUT value in search crit file.
DCANTIOCTL	27	Cannot ioctl() the open serial port.
DUNTILDRS	28	Specified 'until' time reached
DBADCHANNEL	29	Bad GOES channel number specified in search crit

DCANTOPENSER	30	Can't open specified serial port.
DBADDCPNAME	31	Unrecognized DCP name in search criteria
DNONAMELIST	32	Cannot attach to name list shared memory.
DIDXFILEIO	33	Index file I/O error
DNOSRCHSEM	34	Cannot attach to search semaphore
DUNTIL	35	Specified 'until' time reached
DJAVAIF	36	Error in Java - Native Interface
DNOTATTACHED	37	Not attached to LRGS native interface
DBADKEYWORD	38	Bad keyword
DPARSEERROR	39	Error parsing input file
DNONAMELISTSEM	40	Cannot attach to name list semaphore.
DBADINPUTFILE	41	Cannot open or read specified input file
DARCFILEIO	42	Archive file I/O error
DNOARCFILE	43	Archive file not opened
DICPIOCTL	44	Error on ICP188 ioctl call
DICPIOERR	45	Error on ICP188 I/O call
DINVALIDUSER	46	Invalid user name
DDDSAUTHFAILED	47	DDS Authentication Failure
DDDSINTERNAL	48	DDS Internal Error
DDDSFATAL	49	DDS Fatal internal server error
DNOSUCHSOURCE	50	Search criteria specified an invalid data source.

Troubleshooting

Troubleshooting tips

XC DDS relies on an internet connection to download satellite messages. XC DDS connects to the DDS server via TCP/IP. Select the **Detailed Status** messages option from the Options main menu. This will enable all messages sent and received from the port to be viewed by the users. A DDS server may be off-line due to maintenance or unexpected problems. However, the XC DDS allows user to add two additional DDS server IP addresses in order to switch from one to other if one DDS server is down.

Internet connectivity

Ensure that your PC is connected to the internet. Open the Internet Explorer and verify it can open the default home page.

Incorrect DDS IP address

Ensure the correct IP address has been typed in. You contact with NOAA or USGS for a valid DDS server IP address.

Incorrect login passwords

Ensure the correct the user name and the password are typed in. Secondly, verify that your login user name is an accepted user name by the DDS server.

Invalid satellite IDs

While viewing the detailed messages during download sessions, the DDS server will also send error or warning messages such as "Invalid user name". Carefully review the detailed messages and read any messages generated by XC DDS.

Error Messages

Potential error messages generated by XC DDS are:

Error 1: User does not have correct privileges to perform action.

Troubleshooting steps:

Reasons for error:

- User name is not configured for read/write privilege.
Return to XC Desktop to configure user privileges.

Error 2: Invalid user/password settings.

Troubleshooting steps:

Ensure that:

- User name and password are entered correctly.
- Caps lock key is on (User name and passwords are case-sensitive).

Error 3: Unable to run.

Troubleshooting steps:

Potential reasons for error:

- Application on Run parameter line does not exist.
Make sure the correct path and name are typed (i.e. c:\myapp\mynewapp.exe)
- First application on Run parameter is run but others are not.
If all paths and filenames are correct, make sure each application name is separated by a **comma only** and not a comma and space.

Error 4: An instance of the "XCSetup.Applications" OLE Automation class could not be created. Is XC Setup running?

Troubleshooting steps:

A COM interface connection is made by each XConnect application to XC Setup. This allows the applications to retrieve and send configuration parameters related to XC Mux.

Potential reasons for error:

- XC Setup is not running.
Close current application and restart. XC Setup should start automatically.
- XC Setup does not start automatically with XConnect application.
Close current application. Start XC Setup manually from Start Menu. Then re-start XConnect application.
If error still persists, reboot computer.

Error 5: XC Setup is not running. Process halted.

Troubleshooting steps:

XC Setup must be running for all other XConnect applications to function properly. Various parameters are retrieved and stored by the XConnect applications.

Each XConnect application will attempt to start XC Setup if it is not running.

Ensure that:

- XC Setup (XCSetup.exe) is in XConnect home directory.
[Using Windows Explorer or My Computer, ensure that XC Setup was not accidentally deleted from the XConnect install directory. If not present, insert XConnect installation CD to repair.](#)

Error 6: An error occurred while retrieving parameters from XCSetup.

Troubleshooting steps:

Potential reasons for error:

- XC Setup is not running.
[Ensure that XC Setup is shown on the Windows taskbar.](#)
- COM connection to XC Setup is corrupted. Close current application and re-start.

Error 7: Unable to retrieve General Setup parameters.

Troubleshooting steps:

Potential reasons for error:

- XC Setup is not running.
[Ensure that XC Setup is shown on the Windows taskbar.](#)
- COM connection to XC Setup is corrupted. Close current application and re-start.

Error 8: Invalid License Key. Please verify XConnect is properly installed.

Troubleshooting steps:

Ensure that:

- Current XConnect application is part of the purchased XConnect license.
[Refer to the original purchase order.](#)

Error 9: Invalid License Key. Exiting now...

Troubleshooting steps:

Potential reasons for error:

- Current XConnect application is not valid for use with existing XConnect license.
[Call Sutron Sales to upgrade XConnect license.](#)

Error 100: Unable to open file xxx.

Troubleshooting steps:

Ensure that:

- File name exists in the directory. Verify using Windows Explorer or My Computer.

Error 101: Unable to read file xxx.

Troubleshooting steps:

Potential reasons for error:

- File may be corrupt. If it is an ASCII file, can it be opened in Notepad.
- File may be correct extension by wrong expected format. Choose another file.

Error 1800: Unable to retrieve XC DDS setup parameters.

Troubleshooting steps:

Potential reasons for error:

- XC Setup is not running.
Ensure that XC Setup is shown on the Windows task bar.
- COM connection to XC Setup is corrupted. Close current application and re-start.

Error 1801: Unable to update XC DDS setup parameters.

Troubleshooting steps:

Potential reasons for error:

- XC Setup is not running.
Ensure that XC Setup is shown on the Windows taskbar.
- COM connection to XC Setup is corrupted. Close current application and re-start.

Error 1802: Failed to connect to xxx.xxx.xxx.xxx, check IP address or port number.

Troubleshooting steps:

Potential reasons for error:

- Invalid IP address
Ensure that the DDS IP address in the XC DDS setup parameters window is valid.
- No internet connection.
Ensure that you have internet connectivity. Open Internet Explorer and verify the home page can be accessed.

Error 1803: Attempted all retries. Failed to connect to xxx.xxx.xxx.xxx.

Troubleshooting steps:

Potential reasons for error:

- XC DDS failed to connect to DDS IP address.
Ensure that the DDS IP address in the XC DDS setup parameters window is valid.
Ensure that you have internet connectivity. Open Internet Explorer and verify the home page can be accessed.

Error 1804: Failed to login to xxx.xxx.xxx.xxx, check user name and password.

Troubleshooting steps:

Potential reasons for error:

- User name or password for logging onto the DDS server is incorrect.
Ensure that the user name or password in the XC DDS setup parameters window is valid for the specified DDS server.

Error 1805: Failed to upload search criteria xxxx.

Troubleshooting steps:

Potential reasons for error:

- DDS server could be down.
Ensure if the DDS server you are trying to connected to is not down. Try to ping the address in the Command Prompt box.
- No internet connection.
Ensure that you have internet connectivity. Open Internet Explorer and verify the home page can be accessed.

Error 1806: DDS Server Error Code code#: code description.

Troubleshooting steps:

Error resulted from the DDS server side. Please refer to the [DDS Server Error Codes](#) in the Advanced topics.

Check the Detailed Status button to see the complete error description.

Error 1807: No station is in download list. Go to XC Desktop to add stations.

Troubleshooting steps:

Potential reasons for error:

- No stations selected in Sat ID Download List.
Open XC DDS Satellite ID Download List window to make sure a station appeared in the Sat ID Download List box.
- No stations are defined in XC Desktop.
Open XC Desktop and configure stations and sensors.

Error 1808: No IP addresses specified for DDS servers.

Troubleshooting steps:

Ensure that:

- DDS server IP addresses are entered correctly.

Error 1809: Download list size exceeds the limit in DDS server.

Troubleshooting steps:

Ensure that the size of the search criteria is not over 16,000 bytes/characters.

- The station list will need to be reduced. Please go to the Satellite ID Download List window to modify the station list.

Error 1810: No user name is specified.

Troubleshooting steps:

Ensure that:

- User name and/or password are entered correctly.

Error 1811: Error on socket connection.

Troubleshooting steps:

Potential reasons for error:

- Check if the network for the computer is shut down.
- Check with your network administrator to make sure you have permissions to go through the certain IP address and port number.
- Make sure all the DDS servers you try to connect are in the service.

Error 1812: Error downloading DCP messages due to server error.

Troubleshooting steps:

Error resulted from the DDS server side. Please refer to the [DDS Server Error Codes](#) in the Advanced topics.

Check the Detailed Status button to see the complete error description.

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