

Reference Manual

Simrad FX80

Catch monitoring system with live video feed





KONGSBERG

Simrad FX80
Catch monitoring system
Reference Manual
Release 2.3.1

This manual provides you with reference information required to operate and fully understand the commands, menus, modes and options provided by the Simrad FX80 Catch monitoring system.

Document information

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Warning

The equipment to which this manual applies must only be used for the purpose for which it was designed. Improper use or maintenance may cause damage to the equipment and/or injury to personnel. You must be familiar with the contents of the appropriate manuals before attempting to operate or work on the equipment.

Kongsberg Maritime disclaims any responsibility for damage or injury caused by improper installation, use or maintenance of the equipment.

Disclaimer

Kongsberg Maritime AS endeavours to ensure that all information in this document is correct and fairly stated, but does not accept liability for any errors or omissions.

Support information

If you require maintenance or repair, contact your local dealer. You can also contact us using the following address: simrad.support@simrad.com. If you need information about our other products, visit <https://www.simrad.com>. On this website you will also find a list of our dealers and distributors.

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About this manual

The purpose of this manual is to provide the descriptions, procedures and detailed parameter explanations required to allow for safe and efficient use of the Simrad FX80. The manual also provides you with a thorough understanding of the FX80 parameters and adjustments.

Note

This manual does not provide any information related to the operation of the Simrad DFS75 Trawl sonar. For such information, refer to the relevant DFS75 end-user documentation.

Target audience

This manual is intended for all users of the FX80. Due to the nature of the descriptions and the level of detail provided by this manual, it is well suited for those who are - or wish to be - expert users.

A good understanding of system functions and controls is essential to fully take advantage of the functionality provided. Sea conditions vary, sometimes drastically, and it is not possible to identify settings that will provide the best data at all times. A careful study of the information in this manual is highly recommended, preferably while exploring the FX80 functionality.

We assume that you are familiar with the basic acoustic principles of sound in water. We also expect that you have some experience with catch monitoring systems.

Use the Help button

Installed on your FX80 you will find a comprehensive context-sensitive online help system. Everything you can read in the FX80 Reference Manual can also be found in the online help. To open the context sensitive on-line help, select **Help** on the top bar, or the **Help** button in one of the dialog boxes.

Online information

All end-user manuals provided for operation and installation of your Simrad FX80 can be downloaded from our website.

- <https://www.simrad.com/fx80>

Our website also provides information about other Simrad products.

License information

The FX80 is not a licensed product.

Software version

This FX80 Reference Manual complies with software version 2.3.1.

Registered trademarks

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We want your feedback

We want to improve FX80 continuously. We also want our end-user documentation to be comprehensive and relevant. You can help. Please provide comments, suggestions or constructive criticism to any of our support offices.

Simrad FX80

Topics

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Important

The FX80 is an advanced product. As with most other advanced instruments, there is important information that you need to know.

When the FX80 is not used

When you are not fishing, and the FX80 units are on board, switch off the entire system.

If something breaks down

If you believe that something has broken down, contact your local dealer. A list of all our dealers is provided on our website.

- <https://www.simrad.com>

If you are unable to contact a dealer, observe the support information in this publication.

When you want to turn off the FX80

You must NEVER turn off the FX80 by means of the on/off switch on the Processor Unit. You must always exit the FX80 application by clicking the **Exit** icon on the top bar.

Note

If you turn off the FX80 by means of the on/off switch on the Processor Unit you may damage the software and the interface settings used to communicate with external devices.

Rules for Sonar Head handling

A Sonar Head must always be handled as a delicate instrument. Incorrect actions may damage the Sonar Head beyond repair. Observe these Sonar Head handling rules:

- **Do not** activate the Sonar Head when it is out of the water.
- **Do not** handle the Sonar Head roughly and avoid impacts.
- **Do not** expose the Sonar Head to direct sunlight or excessive heat.
- **Do not** use high-pressure water, sandblasting, metal tools or strong solvents to clean the Sonar Head face.
- **Do not** damage the outer protective skin of the Sonar Head face.
- **Do not** lift the Sonar Head by the cable.
- **Do not** step on the Sonar Head cable.
- **Do not** damage the Sonar Head cable, and avoid exposure to sharp objects.

System description

The Simrad FX80 is an innovative and advanced catch monitoring system that allows you to monitor the fish activity inside your fishing gear using a live video stream. The FX80 is used with the Simrad DFS75 high-resolution trawl sonar.

A real-time video feed from the trawl has long been desired by fishermen and researchers alike, but cabling and slip rings have been an issue. One of the primary design criteria of the Simrad FX80 system was to make it work on existing third-wire cables. We have achieved this goal by using existing copper-core coax cables to ease the cost and reduce installation time.

Real-time video can be used to address by-catch and by-catch avoidance issues. Trawl behaviour can be viewed in real time with the FX80 system. Fish behaviour can also be observed in real time, taking speculation and guess work out of the equation. This innovation has the potential to increase the efficiency of any trawling operation and will stimulate the creativity of fishermen, trawl and gear manufacturers, and of course, Simrad.

The Simrad DFS75 Trawl sonar is integrated into the Simrad FX80 system to establish an efficient and accurate monitoring system for your gear and your catch. The combination of the high-resolution images from the trawl sonar and the live video feed provides you with an unparalleled opportunity to identify and analyze both trawl movements and fish behaviour.

The Simrad FX80 system is based on a well-proven high-resolution underwater camera from Kongsberg Maritime. Accompanied by a high-density LED lamp (due to the lack of ambient light), the camera is usually placed under the headrope or in the cod end, pointing at the desired angle. The camera sends its information to the FX80 Communication Hub installed inside the FX80 Deployment Unit, which is usually located near the headrope. The communication between the hub and FX80 Bridge Control Unit is made by a standard third-wire cable.

The entire Simrad FX80 system - with live video and high-resolution sonar - is controlled from a standard Processor Unit provided by Simrad. It is small, yet powerful, and contains no moving parts. The system design allows you to use two displays. Many users prefer this configuration, as it allows them to use one display for the trawl sonar presentations, and another for the live video feed.

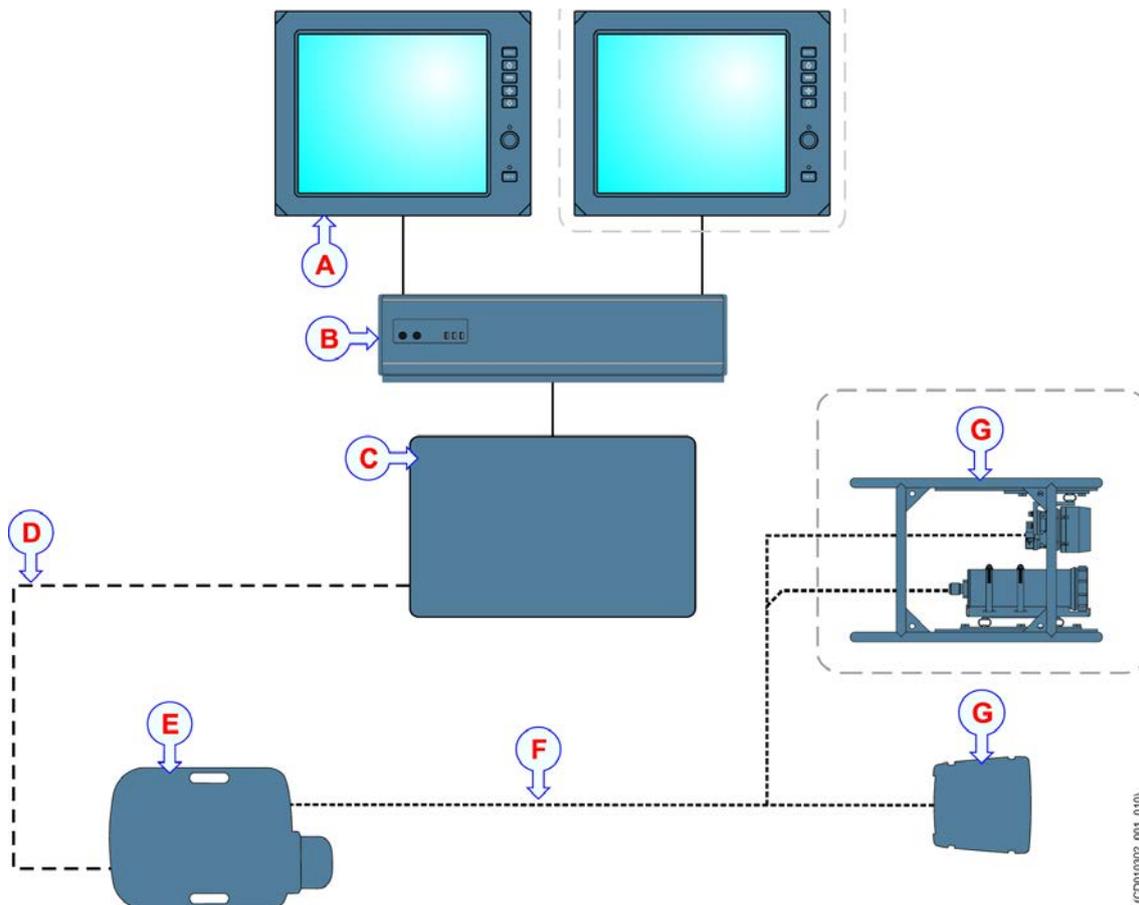
Key features

By innovative use of high-resolution real-time video, the Simrad FX80 offers unique features to make your trawler operations more efficient.

- Revolutionizes your ability to identify, analyze and catch
- Live video feed from inside the trawl
- Video recording, editing, export and playback
- High-resolution colour sonar and echo-sounder images
- Uses standard third-wire cable
- Small and lightweight system offers easy installation
- Easy operation using familiar graphic interfaces
- System includes high-resolution Simrad DFS75 Trawl sonar

System diagram

The system diagram identifies the main components of a basic FX80 system. Only the main connections between the units are shown. Detailed interface capabilities and power cables are not shown.



The system comprises the following units and main parts:

- A *Colour display(s)*
- B *Processor Unit (computer)*
- C *Bridge Control Unit*
- D *Commercial third-wire cable on a winch (not supplied by Simrad)*
- E *Trawl Unit (includes Communication Hub and the Sonar Head for the DFS75 Trawl Sonar)*
- F *Fourth-wire cable between the Trawl Unit and the Camera Unit (a winch is recommended for cables longer than approximately 60 meters)*
- G *Camera Unit with camera and LED lamp (including Y-split cable)*

Note

The system requires only one Camera Unit, but several models are available. Two different models of the FX80 Camera Unit are shown here for illustrative purposes.

The FX80 Camera Unit (containing the camera and LED lamp) can be remotely mounted on the trawl up to 600 meters from the headrope. In these cases there is a need for a fourth-wire winch to handle this cable. This winch needs to be installed on deck in a practical location as the (up to) 600 meters of cable will be spooled entirely off and then back on with each tow. In applications where the camera is located on a kite or at the headrope, there is no need for this cable and winch. This fourth wire is supplied by Simrad. The required length can be decided at the time of purchase, or lengths can be added at a later time. The system itself is not set for any particular length.

The number of displays must be chosen to fit the preferences of the crew. Many users prefer separate displays for the trawl sonar and the live video feed.

Note

Displays are not included in the standard delivery from Simrad. These are commercial items that can be purchased locally. The winch system on the trawl deck and the third-wire cable must also be provided by a third-party manufacturer.

System units

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Processor Unit

In this publication, the computer is referred to as the Processor Unit. The Processor Unit is the computer that controls the FX80 system. It is a vital part of the FX80 Catch monitoring system. The Processor Unit contains the operational software, and offers the user interface that allows you to control the FX80. Furthermore, it offers a number of serial and Ethernet lines for communication with external devices. The Processor Unit is normally mounted on the bridge.

Although a computer can be ordered from Kongsberg Maritime as a part of the FX80 delivery, it is also possible to purchase one locally. If you purchase a computer locally, make sure that the chosen model meets the functional and technical requirements. The computer must meet the operating system requirements provided by Microsoft®. The computer must also provide the necessary interface facilities that your FX80 needs to communicate with peripheral systems. The computer must be designed for rugged use, and the construction must be able to withstand the vibrations and movements of a vessel. The operating system must be Microsoft® 64-bit Windows 10.



A high quality Ethernet adapter is required. If you wish to connect the Processor Unit to the ship's network, you will need two Ethernet adapters.

A suitable computer may be provided with the FX80. Consult your local dealer or agent for more information.

The Processor Unit is designed for rugged maritime use. It has been customized by Kongsberg Maritime. The computer is based on a commercial design, but the software and hardware have been specified by Kongsberg Maritime to suit the FX80 requirements. It is set up with all necessary software.

Note

The operating system has been modified to make the computer work with the FX80. These modifications include removal of all safety features provided by Microsoft®. The built-in firewall and all virus protection features have been removed. Any attempt to use the computer for any other purposes than FX80 operation, such as games, desktop applications and Internet connection, may result in serious damage to the program. Such damages are not covered by the warranty.

The FX80 design supports two displays. This can be a practical solution. One display is then set up to monitor the video feed, while the other is used to operate the trawl sonar.

Bridge Control Unit

The Bridge Control Unit provides all the interface and power supply functionality for the Simrad FX80 system.

It is connected to the Communication Hub in the Trawl Unit with a high-quality third-wire cable. This cable is used for both data communication (live video and sonar feed) and power.

The Bridge Control Unit is connected to the computer with an Ethernet cable. Additional Ethernet connections allow you to connect a second computer, and/or interface the ship's network. A serial line is provided to communicate with the ship's navigation system.

The Bridge Control Unit is designed for installation in a 19" rack. Its total height is 4U, and the depth is approximately 490 mm including the handles.



Trawl Unit

The Trawl Unit is made up of several components, including the DFS75 Sonar Head and Communication Hub, enclosed in a Deployment Pack.

The Trawl Unit's Deployment Pack is the main underwater container for the Simrad FX80 system. It is made from polyurethane and has been designed for tough use in the harshest of environments, yet it is easy to handle.

There are two separate units assembled within the steel frame of the Deployment Pack. The first unit is the DFS75 Sonar Head. The second unit is the Communication Hub. The third-wire cable is connected to this hub, which provides the interfaces to the Camera Unit and the DFS75 Sonar Head.

The mounting kit supplied contains the strain-relief cable gland, the pigtail, and other hardware devices used to attach the trawl cable to the headrope on the trawl.



Camera Unit

The Camera Unit is the assembly that contains the underwater monochrome camera and the powerful LED lamp.

The ambient light conditions may be poor in deep water. For this reason, the FX80 Camera Unit has been fitted with a powerful LED lamp.

The Camera Unit is normally mounted inside the trawl opening, or above the cod end. It is connected to the Communication Hub inside the Trawl Unit using a dedicated fourth-wire cable.

There are several Camera Unit models available — the North American and European models are shown here. The North American Camera Unit has a metal frame with the camera and lamp mounted inside. On the European Camera Unit, the camera and lamp are mounted inside a polyurethane deployment pack.

Tip

On large trawls, the distance between the Trawl Unit and the Camera Unit will require a very long fourth-wire cable. We recommend the use of a second winch with drum to hold this cable.



Network security

If a FX80 system is connected to a local area network, data security is important.

Equipment manufactured by Kongsberg Maritime is frequently connected to the vessel's local area network (LAN). When you connect a computer to a local area network you will always expose the data on that computer. All other computers connected to the same network may be able to access your data. Several threats may immediately occur:

- Remote computers can read the data.
- Remote computers can change the data.
- Remote computers can change the behaviour of the computer, for example by installing unwanted software.

Usually, two parameters are used to define the threat level:

- 1 The likelihood that any remote computer will do any of the above.
- 2 The damage done if a remote computer succeeds doing this.

Kongsberg Maritime has no information regarding the complete system installation on any vessel. Systems provided by Kongsberg Maritime are regarded as stand-alone offline systems. They are stand-alone even though they may be connected to a network for sensor interfaces and/or data distribution.

Note

No network safety applications are installed on Kongsberg Maritime computers. The computers are therefore not protected against viruses, malware or unintentional access by external users.

Securing the FX80 system itself has no meaning unless there is a policy in place that secures all computers in the network. This policy must include physical access by trained and trusted users. The customer/end user of the FX80 system will always be in charge of defining and implementing a security policy, and providing the relevant network security applications.

Note

Kongsberg Maritime will not accept any responsibility for errors and/or damages caused by unauthorized use of or access to the FX80.

Support information

If you need technical support for your Simrad FX80 you must contact your local dealer, or one of our support departments. A list of all our offices and dealers is provided on our website. You can also contact our main support office in Norway.

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Getting started

Topics

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[Installing the FX80 operational software, page 30](#)

[Setting up the Ethernet communication, page 31](#)

[Starting normal operation, page 33](#)

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Read this first

"Getting started" is all about setting up the FX80 Catch monitoring system for the first time. This can be because the FX80 has just been unpacked or installed. You may also be a first time user on an existing system.

Is this a new installation?

We assume that all the necessary hardware units have been installed.

The following software tasks are relevant.

- 1 Power up the Processor Unit, the display, and the relevant hardware units.
- 2 Install the FX80 software.
- 3 If required, define the IP address on the Processor Unit network adapter.
- 4 Start the FX80 program.
- 5 Define the requested presentations.
- 6 Set up the interfaces with the external devices (navigation sensors and other peripherals).
- 7 Investigate the features and functionality offered by the FX80.

Turning the FX80 on and off

Topics

[Turning on the entire FX80 system for the first time, page 25](#)

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Turning on the entire FX80 system for the first time

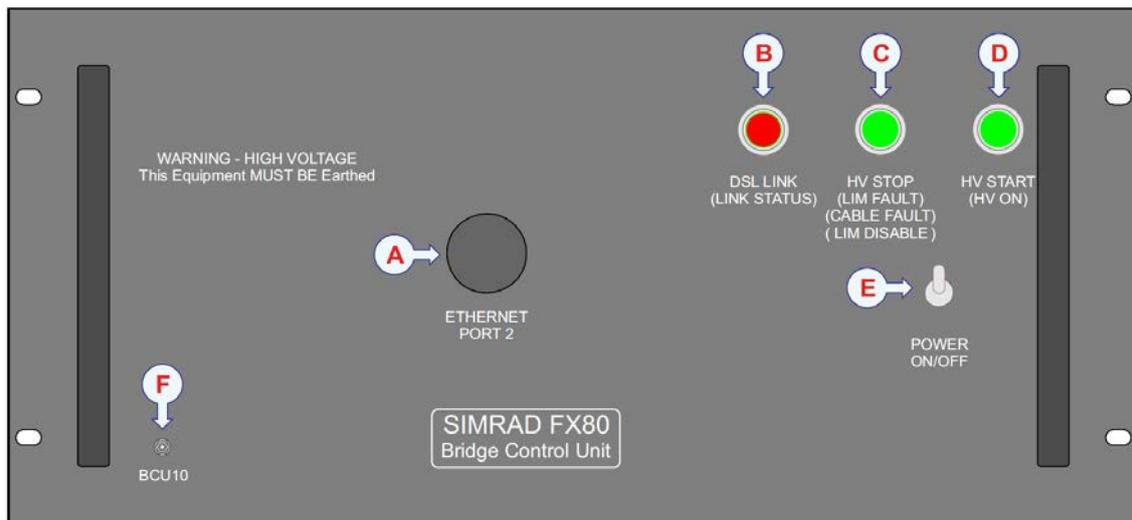
In order to use the FX80, you must first turn it on. You must first power up the Bridge Control Unit, and then the Processor Unit. After this you can start the FX80 program. If you have a Sonar Head connected to your FX80 system, it is usually started once the Communication Hub is online and operational.

Prerequisites

- The FX80 has been set up with its hardware units connected as specified in the relevant FX80 end-user documentation.
- The Bridge Control Unit is connected to the Communication Hub with the test cable.
- The Communication Hub is connected to the DFS75 Sonar Head.
- The Communication Hub is connected to the camera and the lamp with the Y-split cable.

Context

The Bridge Control Unit provides all the interface and power supply functionality for the Simrad FX80 system.



- A *Ethernet Port 2*
- B *Digital Subscriber Line link button*
- C *High Voltage stop button*
- D *High Voltage start button*
- E *Power switch*
- F *Ground pin*

Procedure

Important

When turning on the FX80 for the first time, use the test cable. After you have made sure the system works with the test cable, repeat this power-up procedure using the third-wire cable.

- 1 Power up the Bridge Control Unit.

Observe that the DSL Link button light briefly turns on, then turns off.

Note

There are two power switches on the Bridge Control Unit, one on the front panel and one on the rear panel. Both switches must be set to "On". During normal operation, you only need to use the front mounted switch (E) to power on (and off) the unit.

- 2 Turn on the display.

If required, refer to the instructions provided by the display manufacturer.

- 3 Turn on the Processor Unit.

Wait while the operating system loads.

- 4 Double-click the FX80 icon on the Processor Unit desktop to start the program.

Note

The FX80 program is not automatically started when the Processor Unit is turned on.

- 5 Once the program has started, observe that the presentation fills the entire screen.

The program starts up using the same settings as the last time you used it. If these settings are acceptable, continue operation. If you wish to alter any of the settings, see the relevant procedures.

- 6 Press **HV Start** (D) on the Bridge Control Unit.

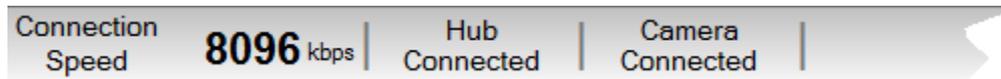
Observe that the **HV On** light turns on. Wait for the **Link Status** light (B) to flash slowly, then quickly, then turn solid. When lit continuously, the **Link Status** light indicates that a communication link is established between the Communication Hub and the Bridge Control Unit.

- 7 Make sure that the blue indicator light on the Communication Hub is lit.

This light indicates that the high voltage from the Bridge Control Unit is present.

- 8 At the bottom of the FX80 presentation, verify that the camera is connected.

The current connection speed between the Bridge Control Unit and the Communication Hub is also shown. The speed depends on the length and quality of the third-wire cable.



- 9 Start the video feed
- On the **Operation** menu, select **Live Feed** to open the video functions.



- Click the left button [▶] to start the video feed.



- Verify that the video feed is operational.
- Click either side ([+] and [-]) of the **Camera Lamp** button to decrease and increase the intensity of the light.



- Verify that the lamp is operational.
- 10 Start the DFS75 Trawl sonar.
- On the FX80 **Operation** menu, click the **Aux 1** button to enable Auxiliary Port 1.



Note _____

Aux 1 is the default label for this button. If you create a custom button label (Setup→System Setup→Aux 1→Button Label), then this button will have a different name.

- Double-click the DATSS icon on the Processor Unit desktop to start the program.

Note _____

The DATSS program is not automatically started when the Processor Unit is turned on.

If you use only one display, the trawl sonar presentation will now fill the screen. Switch between the FX80 and DATSS software in the Windows taskbar. If you have two displays, use the operating system functionality to move one of the programs to the other display.

- Click the **Setup** tab on the right side of the presentation.

Observe that the **Setup** menu opens.

- d Click the **Connect Sonar** button.



Observe that the **Connect Sonar** dialog box opens.

- e In the **Devices** list, select the port your Sonar Head is connected to.

Tip

*If the expected port does not appear at first, click the **Reset** button to refresh the list of available ports.*

- f Check the **Enable for Head Control** box.

- g Click the **Detect Heads** button.

A progress bar will be shown as the software establishes communication with the Sonar Head. When each Sonar Head has been detected, it will appear in the **Devices** list with details shown at the bottom of the dialog box.

- h Click **Apply** to save any changes you have made.

- i Click **OK** to close the **Connect Sonar** dialog box.

- j Click **System**.



The **System** button is always available in the **Main** menu at the bottom-right corner of the display presentation, unless you have chosen to hide the menu system. Observe that a submenu opens when you click the button.

- k Select *Run*.

Wait for the Sonar Head to start.

Caution

Do not connect or disconnect any cables while the system is turned on. Do not leave power on to ports that aren't connected to anything (even if there are dummy plugs installed).

Turning off the FX80

You must NEVER turn off the FX80 by means of the on/off switch on the Processor Unit. You must always close the FX80 program by selecting **Exit** on the top bar.

Context

When you do not use the FX80, turn off the display and the Processor Unit. It is important that you disconnect the high voltage power to the Communication Hub. To disconnect the high voltage power, switch off the Bridge Control Unit.

Caution

Do not connect or disconnect any cables while the system is turned on. Do not leave power on to ports that aren't connected to anything (even if there are dummy plugs installed).

Procedure

- 1 If applicable, power off the DFS75 Trawl sonar.
 - a In the DATSS software, click the **System** button to see the available choices.
 - b Select **Stop** to stop the operation.

Neither transmission nor reception takes place, and there is no communication between the Processor Unit and the Sonar Head.
 - c Select **Off** to close the program.
- 2 In the FX80 software, click the **Aux 1** button to disable Auxiliary Port 1.

Note

Aux 1 is the default label for this button. If you create a custom button label (Setup→System Setup→Aux 1→Button Label), then this button will have a different name.

- 3 Select **Exit** on the top bar.

Observe that the FX80 program closes down.
- 4 Press **HV Stop** on the Bridge Control Unit.

This removes the high voltage power to the Communication Hub in the Trawl Unit.
- 5 Power off the Bridge Control Unit.

There are two power switches on the Bridge Control Unit, one on the front panel and one on the rear panel. During normal operation, you only need to use the front mounted switch to power on (and off) the unit.
- 6 If the Processor Unit does not turn itself off automatically, use the functionality provided by the operating system to turn it off manually.

- 7 Turn off the display.
If required, refer to the instructions provided by the display manufacturer.
- 8 Retrieve the trawl.
- 9 Disconnect the cables between the units, and remove each unit from the gear.

Installing the FX80 operational software

If your FX80 Catch monitoring system is provided with a Processor Unit, the FX80 software has already been installed. If you intend to use your own computer, you must install the software yourself. When a new FX80 software version is released, it must be installed on your Processor Unit.

Prerequisites

In order to install the software, you need the relevant file set on a suitable media. If the software is provided on a CD or a DVD, and your computer is not fitted with a suitable drive, copy the files to a USB flash drive.

Note

Make sure that you have administrative rights on the Processor Unit. You need this to install the software. If you purchased your own computer, you must verify that it meets the technical requirements for use with the FX80. Do this before you install the software.

If you are installing a new software version, uninstall previous versions of the software before proceeding.

Procedure

- 1 Install the FX80 software.
 - a Double-click the **.exe** file to start the installation.
 - b Allow the installation wizard to run. Follow the instructions provided.
We recommend that you install the software in the default folder suggested by the wizard.
 - c Once the software installation has been completed, double-click the icon on the desktop to start the program.
 - d Confirm the software finishes launching without any error windows appearing.
- 2 Install the DATSS software.
 - a Double-click the **.exe** file to start the installation.
 - b Allow the installation wizard to run. Follow the instructions provided.
We recommend that you install the software in the default folder suggested by the wizard.

- c Click **Yes** to install the **KML USB Converter** when prompted and follow the instructions to finish the installation process.
- d Once the software installation has been completed, double-click the icon on the desktop to start the program.

Note

When running the software for the first time, a Windows Firewall dialog box may appear. Allow access for all networks.

- e Confirm the software finishes launching without any error windows appearing.

Setting up the Ethernet communication

The communication between the Processor Unit and the Bridge Control Unit is made using a high-speed Ethernet cable. You must define which IP Address and Subnet mask the Ethernet adapter in the Processor Unit shall use for this communication.

Prerequisites

This procedure is made for the Microsoft® 64-bit Windows 10 operating system. It is assumed that you are familiar with the Windows® operating systems, computer technology, and interface principles.

Context

As long as you do not change the Processor Unit to another computer, or replace the network adapter in your Processor Unit, you will only need to do this once.

Procedure

- 1 On the Processor Unit, close the FX80 software.
- 2 Open the **Network Connections** dialog box.
 - a In the bottom-left corner of your desktop, select the Windows® **Start** button.
 - b On the menu, select **Settings**.
 - c Observe that the **Windows Settings** dialog box opens.
 - d Select **Network & Internet**.
 - e Select **Change adapter options**.
 - f Select the network adapter you are going to use; then right-click and select **Properties** on the short-cut menu.
 - g On the list of connections, select **Internet Protocol 4 (TCP/IPv4)**, and then **Properties**.

- 3 Select **Use the following IP address**, and type the IP address and network mask.
IP Address: **10.0.0.1**
Subnet mask: **255.255.255.0**
Default gateway: **10.0.0.5**
- 4 Select **OK** to save the settings, then close all the dialog boxes.

Starting normal operation

Topics

[Starting the live video feed, page 34](#)

[Controlling the ambient light conditions for the camera, page 34](#)

[Recording video sequences, page 35](#)

[Replaying previously recorded video sequences, page 36](#)

Starting the live video feed

The main purpose of the FX80 is to provide a real-time video feed from the chosen location on the fishing net. Provided that the FX80 units have been powered up with the necessary items correctly positioned, you can easily start and stop the video feed.

Context

The **Live Feed** functions allow you to control the presentation of the video information from the camera. Several additional functions are provided when the **Live Feed** is activated. You can start and stop video recording. You can also control the intensity of the lamp, or switch it off.

Procedure

- 1 Select the **Operation** icon.
It is used to open the **Operation** menu.
- 2 Select **Live Feed** to open the video functions.
- 3 Click the left button [▶] to start the video feed.



- 4 Select the middle button [■] to stop the live video feed.

Related topics

[Live Feed function, page 73](#)

Controlling the ambient light conditions for the camera

A powerful LED lamp is provided to illuminate the area close to the camera. By means of the **Camera Lamp** function you can adjust the intensity of the floodlight, or switch it off altogether.

Procedure

- 1 Select the **Operation** icon.
It is used to open the **Operation** menu.
- Select **Live Feed** to open the video functions.
- 2 Click the middle of the **Camera Lamp** button to switch the light off or on.



- 3 Click either side ([+] and [-]) of the **Camera Lamp** button to decrease and increase the intensity of the light.

Related topics

[Live Feed function, page 73](#)

Recording video sequences

The main purpose of the FX80 is to provide a real-time video feed from the chosen location on the fishing net. The **Record** function allows you to record the video feed received by the camera.

Prerequisites

Before you start recording, make sure that you have defined where you wish to store the data files. We recommend that you set up all the necessary recording parameters before you start data recording. The **Video** dialog box allows you to control the file locations and file names for the video and screen capture files.

Context

Video data files will normally become very large. If you wish to record large amounts of FX80 data, make sure that you have enough space on your hard disk. Unless your Processor Unit is equipped with a very large disk, we recommend that you save the data to an external storage device. If the FX80 detects that you have less than 500 Mb available on your hard disk, it will automatically stop the recording and provide a message.

Procedure

- 1 Select the **Operation** icon.

The icon is located under the **Main** menu. It is used to open the **Operation** menu.

- 2 Select **Live Feed** to open the video functions.



- 3 Click the left button [▶] to start the video feed.



- 4 To start recording, click the red **Record** icon.
- 5 To stop recording, click the red **Record** icon one more time.

Tip

*You can also use the **Record** button on the top bar to start and stop recording.*



Related topics

[Live Feed function, page 73](#)

Replaying previously recorded video sequences

The **Replay** function allows you to recall any previously recorded video file to see it one more time. The video playback is controlled from the **Replay** function on the **Operation** menu.

Context

During replay, the phrase "REPLAY" is shown with red characters at the bottom of the FX80 presentation.

Procedure

- 1 Select the **Operation** icon.

It is used to open the **Operation** menu.

- 2 Select **Live Feed** to open the video functions.



- 3 Select the middle button [■] to stop the live video feed.

- 4 Click the **Replay** button to open the playback functions.



- 5 Click the **Open** button to open the video file you wish to play back.



A standard operating system dialog box opens to let you choose the folder and file.

- 6 Click the **Play** button [▶] to start the playback.

During the playback, you can click the **Play** button [▶] one more time to pause the video. The symbol in the button then changes to a **Pause** button. To restart the playback, click one more time.

- 7 Use the dedicated replay control buttons to control the replay.



These dedicated buttons are provided to control the progress of the playback. The controls are (from left):

- Jump to start of video file
- Play slow
- Play fast
- Jump to end of video file

- 8 Use the progress bar to move to specific places in the video sequence.



The progress bar is provided to offer a visual presentation of the progress. You can click on the small arrow and drag it in horizontal direction to move the view in the video file.

- 9 To stop the playback, click the **Stop** button [■].



Related topics

[Replay function, page 75](#)

Context sensitive on-line help

FX80 has a comprehensive context-sensitive on-line help system. All information in the FX80 Reference Manual can also be found in the on-line help.

The context sensitive on-line help is provided using a *WebHelp* installation using HTML format. It uses the default web browser on the Processor Unit.

To open the help system, select **Help** in any dialog box. This will provide instantaneous information about the relevant dialog box. Links to related procedures and topics are provided.

You navigate in the help file using the menu system on the left side as well as the interactive links within the document.

Note

*To open the online help on its start page, select **Help** on the top bar. To read about a dialog box and the options provided, select the [?] button in its top right corner.*



The FX80 help may not be available for the language you have chosen for the user interface. If your language is not supported, the English help is provided.

Operating procedures

Topics

[Setting up your system, page 39](#)

[Using the video feed, page 47](#)

[Interfacing peripheral equipment, page 54](#)

Setting up your system

Topics

[Reducing the light emitted from the display presentation, page 40](#)

[Monitoring the communication link, page 40](#)

[Optimizing video performance, page 43](#)

[Compensating for camera rotation, page 44](#)

[Compensating for fourth-wire signal loss, page 45](#)

Reducing the light emitted from the display presentation

When the bridge is dark, the light emitted by the FX80 display can affect your night vision. In order to compensate for this, you can reduce the intensity

Context

The intensity of the light given off by the FX80 presentation can be adjusted. You can use this function to increase or decrease the light from the screen to match the ambient light. The intensity of light emitted by the display can be reduced from 100% to 0% in steps of 10.

Procedure

- 1 Open the **Display** menu.
- 2 Select a **Screen Brightness** setting that fits your requirements.



To change the setting, move the cursor to either side of the button, and observe that the background colour changes. Select [—] on the left side to decrease the value, or select [+] on the right side to increase the value.

Related topics

[Screen Brightness function, page 79](#)

Monitoring the communication link

To maintain the best possible communication quality, monitor the line rates and the status of the Communication Hub frequently. The **ADSL Router** page in the **System Setup** dialog box allows you to monitor the communication link between the Bridge Control Unit and the Communication Hub on the gear. The **Hub Controller** page allows you to monitor the status of the Communication Hub in the Trawl Unit.

Context

Asymmetric Digital Subscriber Line (ADSL) is a data communications technology that enables faster data transmission over copper lines.

ADSL Routers are key components in the FX80 system, as they handle the data communication on the trawl cable between the Bridge Control Unit and the subsea equipment on the gear. One router is physically located inside the Bridge Control Unit, while a similar router is incorporated in the Communication Hub in the Trawl Unit.

Important

Do not modify **System Setup** parameters while you are using *Live Feed* mode.

Procedure

- 1 Select the **Setup** icon.

The icon is located under the **Main** menu.



- 2 Click the **System Setup** button.



- 3 Click the **ADSL Router** tab.

- 4 Observe the **Connection Status** information provided.

- **Up:** The ADSL Router is connected to the Communication Hub, and the communication is operational.
- **ADSL Link Down:** The communication between the Processor Unit and the ADSL Router inside the Bridge Control Unit is operational, but the communication with the ADSL Router in the Communication Hub is not serviceable.
- **Router not available:** There is no network connection between the Processor Unit and the ADSL Router inside the Bridge Control Unit. The system is not operational.

Make sure the Bridge Control Unit is switched on.

- 5 Observe the **Line Rate** parameters to determine the quality of the communication.
 - **Line Rate - Upstream:** This is the current communication speed from the Bridge Control Unit to the Communication Hub in the Trawl Unit. The same information is provided on the **Status Bar** in the bottom-left corner of the FX80 presentation.
 - **Line Rate - Downstream:** This is the current communication speed from the Communication Hub in the Trawl Unit to the Bridge Control Unit.
- 6 For future reference, write down these parameters. They will give you advanced warning of cable and slip-ring issues.

Tip

You will see that the line rates will gradually decrease with time. If the line rates sink below 500 Kbps upstream and 1000 Kbps downstream, the communication has degraded so much that corrective actions may be required. To rectify, you may need to reduce the resolution and/or the frame rate. You should also check the slip ring, the general quality of the third-wire cable, and specifically the pigtail and the splicing.

- 7 Click the **Hub Controller** tab.

- 8 Observe the parameters provided for Communication Hub monitoring.

- **Hub Status:** This field shows you the current status of the Communication Hub.
 - **Connected:** The Communication Hub is connected to the Bridge Control Unit and it is active and operational.
 - **Not Connected:** The Communication Hub is not connected to the Bridge Control Unit. The system is not operational. In this case, all other statuses will be set to “N/A” due to the lack of communication.
- **Camera Status:** This field shows you the current status of the camera.
 - **Authenticated:** The camera is connected to the Communication Hub and is active and operational.
 - **Not Authenticated:** The camera is either not connected to the Communication Hub, or you have attempted to connect a third-party camera. The camera supplied with the FX80 system is constantly polled by the Communication Hub with an authentication request. Other third-party cameras can therefore not be used.
 - **N/A:** The Communication Hub is not communicating with the Bridge Control Unit. The availability of the camera is therefore unknown. The system is not operational.
- **Lamp:** This field shows you the current status of the lamp.
 - **Off:** The lamp is switched off.
 - **On (n%):** The lamp is switched on. The current intensity is indicated as a percentage.
 - **N/A:** The Communication Hub is not communicating with the Bridge Control Unit. The availability of the lamp is therefore unknown. The system is not operational.
- **Auxiliary 1 and Auxiliary 2:** These fields show you the current status of the auxiliary inputs.
 - **Off:** The auxiliary connection is switched off and not used.
 - **On:** The auxiliary connection is switched on and operating.
 - **N/A:** The Communication Hub is not communicating with the Bridge Control Unit. The availability of the auxiliary inputs is therefore unknown. The system is not operational.

9 Select **OK** to close the dialog box.

Related topics

[System Setup dialog box - ADSL Router page, page 92](#)

Optimizing video performance

For the best possible video quality, adjust the video resolution, compression, and frame rate.

Context

The **Video Encoder** page allows you to define the main parameters for live feed, video recording and playback.

Important

Do not modify **System Setup** parameters while you are using *Live Feed* mode.

Procedure

- 1 Select the **Setup** icon.

The icon is located under the **Main** menu.



- 2 Click the **System Setup** button.



- 3 Click the **Video Encoder** tab.
- 4 If required, change the **Resolution**.

This parameter is used to determine video resolution during the live feed and recording.

The resolution provided by the camera is higher than the options you are provided with here. However, the length and quality of your trawl cable may have a negative effect on the video feed, and reduce the video quality. To reduce the strain, you may need to reduce the resolution, as this will reduce the amount of video data to be transferred from the camera up to the computer.

- 5 If required, adjust the video **Compression**.

This parameter allows you to define the video compression.

A higher integer provides higher compression, but will also introduce more lag in the video feed. For best video quality, use a low number. The default value is 30, which is a good trade-off.

- 6 If required, change the **Frame Rate**.

Frame rate (also known as ‘frame frequency’) is the frequency (rate) at which an imaging device produces unique consecutive images called frames. Our brain can process 10 to 12 separate images per second, perceiving them individually. If you

reduce the frame rate, you will see a loss of quality in the video, but the file size will be smaller when you are making a recording.

Unless you have special requirements, use the default value of 15 frames per second.

- 7 Select **OK** to save the selected settings and close the dialog box.

Related topics

[System Setup dialog box - Video Encoder page, page 90](#)

Compensating for camera rotation

During installation, you may not be able to install the FX80 camera in the basic upright position. Also, during operation, the camera may inadvertently be rotated.

Context

The **Video Encoder** page allows you to define the main parameters for live feed, video recording and playback.

Important

Do not modify **System Setup** parameters while you are using *Live Feed* mode.

Procedure

- 1 Select the **Setup** icon.

The icon is located under the **Main** menu.



- 2 Click the **System Setup** button.



- 3 Click the **Video Encoder** tab.
- 4 If required, change the **Rotation**.

If the camera mounted on the gear is not placed horizontally, you can compensate for this using the **Rotation** parameter.

- 5 Select **OK** to save the selected settings and close the dialog box.

Related topics

[System Setup dialog box - Video Encoder page, page 90](#)

Compensating for fourth-wire signal loss

If you need to use a long fourth-wire cable between the Communication Hub and the camera, you may experience signal loss. You can configure the FX80 software to compensate for signal loss.

Context

The **Hub Controller** page allows you to monitor the status of the Communication Hub in the Trawl Unit. This page also allows you to compensate for signal loss if you need to use a long fourth-wire cable between the Communication Hub and the Camera Unit.

If the Camera Unit is physically located some distance from the Trawl Unit on the headrope, this distance will require a long fourth-wire cable between the two units. On larger trawls, the cable may need to be several hundred meters long.

Unfortunately, a long cable will always result in some signal loss, and such loss is annoying on any video system. In order to compensate for a long cable, the FX80 offers the **Long Line Drive** parameter. Using this parameter, you can enter the approximate length of the cable, so that the software can compensate automatically.

Important

Do not modify **System Setup** parameters while you are using *Live Feed* mode.

Procedure

- 1 Select the **Setup** icon.

The icon is located under the **Main** menu.



- 2 Click the **System Setup** button.



- 3 Click the **Hub Controller** tab.
- 4 Observe the quality of the live feed and adjust the **Long Line Drive** parameter to achieve the best possible video quality.

The following options are available.

- **'n' m**: Approximate length of fourth-wire cable.
 - **1200*m**: Special configuration for very long cable.
 - **1200#m**: Special configuration for very long cable.
- 5 Select **OK** to save the selected settings and close the dialog box.

Related topics

[System Setup dialog box - Hub Controller page, page 94](#)

Using the video feed

Topics

[Starting the live video feed, page 48](#)

[Controlling the ambient light conditions for the camera, page 48](#)

[Recording video sequences, page 49](#)

[Replaying previously recorded video sequences, page 50](#)

[Exporting video recordings, page 51](#)

[Enabling video overlays, page 52](#)

Starting the live video feed

The main purpose of the FX80 is to provide a real-time video feed from the chosen location on the fishing net. Provided that the FX80 units have been powered up with the necessary items correctly positioned, you can easily start and stop the video feed.

Context

The **Live Feed** functions allow you to control the presentation of the video information from the camera. Several additional functions are provided when the **Live Feed** is activated. You can start and stop video recording. You can also control the intensity of the lamp, or switch it off.

Procedure

- 1 Select the **Operation** icon.
It is used to open the **Operation** menu.
- 2 Select **Live Feed** to open the video functions.
- 3 Click the left button [▶] to start the video feed.



- 4 Select the middle button [■] to stop the live video feed.

Related topics

[Live Feed function, page 73](#)

Controlling the ambient light conditions for the camera

A powerful LED lamp is provided to illuminate the area close to the camera. By means of the **Camera Lamp** function you can adjust the intensity of the floodlight, or switch it off altogether.

Procedure

- 1 Select the **Operation** icon.
It is used to open the **Operation** menu.
- Select **Live Feed** to open the video functions.
- 2 Click the middle of the **Camera Lamp** button to switch the light off or on.



- 3 Click either side ([+] and [-]) of the **Camera Lamp** button to decrease and increase the intensity of the light.

Related topics

[Live Feed function, page 73](#)

Recording video sequences

The main purpose of the FX80 is to provide a real-time video feed from the chosen location on the fishing net. The **Record** function allows you to record the video feed received by the camera.

Prerequisites

Before you start recording, make sure that you have defined where you wish to store the data files. We recommend that you set up all the necessary recording parameters before you start data recording. The **Video** dialog box allows you to control the file locations and file names for the video and screen capture files.

Context

Video data files will normally become very large. If you wish to record large amounts of FX80 data, make sure that you have enough space on your hard disk. Unless your Processor Unit is equipped with a very large disk, we recommend that you save the data to an external storage device. If the FX80 detects that you have less than 500 Mb available on your hard disk, it will automatically stop the recording and provide a message.

Procedure

- 1 Select the **Operation** icon.

The icon is located under the **Main** menu. It is used to open the **Operation** menu.

- 2 Select **Live Feed** to open the video functions.



- 3 Click the left button [▶] to start the video feed.



- 4 To start recording, click the red **Record** icon.
- 5 To stop recording, click the red **Record** icon one more time.

Tip

*You can also use the **Record** button on the top bar to start and stop recording.*



Related topics

[Live Feed function, page 73](#)

Replaying previously recorded video sequences

The **Replay** function allows you to recall any previously recorded video file to see it one more time. The video playback is controlled from the **Replay** function on the **Operation** menu.

Context

During replay, the phrase "REPLAY" is shown with red characters at the bottom of the FX80 presentation.

Procedure

- 1 Select the **Operation** icon.

It is used to open the **Operation** menu.

- 2 Select **Live Feed** to open the video functions.



- 3 Select the middle button [■] to stop the live video feed.

- 4 Click the **Replay** button to open the playback functions.



- 5 Click the **Open** button to open the video file you wish to play back.



A standard operating system dialog box opens to let you choose the folder and file.

- 6 Click the **Play** button [▶] to start the playback.

During the playback, you can click the **Play** button [▶] one more time to pause the video. The symbol in the button then changes to a **Pause** button. To restart the playback, click one more time.

- 7 Use the dedicated replay control buttons to control the replay.



These dedicated buttons are provided to control the progress of the playback. The controls are (from left):

- Jump to start of video file
- Play slow
- Play fast
- Jump to end of video file

- Use the progress bar to move to specific places in the video sequence.



The progress bar is provided to offer a visual presentation of the progress. You can click on the small arrow and drag it in horizontal direction to move the view in the video file.

- To stop the playback, click the **Stop** button [■].



Related topics

[Replay function, page 75](#)

Exporting video recordings

The **Export Video** functionality allows you to export the video sequences – either in full or an excerpt – you have recorded on the FX80 to another video format.

Context

The **Export Video** functionality provided by the FX80 software will only work with video sequences recorded by the FX80.

Procedure

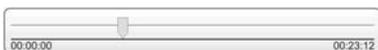
- On the **Operation** menu, click the **Replay** button.



- Click the **Open** button to select the desired video sequence.



- To select the start of the video clip to exported, move the small arrow on the progress bar horizontally until the requested frame is shown, then click **From**.



- To select the end of the video clip to exported, move the small arrow on the progress bar horizontally until the requested frame is shown, then click **To**.

Click the two arrow buttons to jump between the first and last selected frame.

Note

*It is not possible to export video clips that are shorter than 10 seconds, unless the original file is this short. This means that the start and end point of the chosen sequence cannot be less than 10 seconds apart. If the values you select for **From** and **To** are too close together, the FX80 software will correct them for you, and place them 10 seconds apart.*

- 5 Click the **Export** button to save the selected video sequence.

A standard operating system dialog box opens to let you select the file name and folder. You can only save in .avi format.

Related topics

[Replay function, page 75](#)

Enabling video overlays

You can place information (date, location, etc.) on top of the video presentation during playback and/or the live feed.

Context

The **Overlay Settings** dialog box allows you to place information (date, location, etc.) on top of the video presentation during playback and/or the live feed. The overlay information is automatically extracted from the recorded file. The information includes title, date and time, as well as navigational information.

The date and time information is derived from the computer clock, or the GPS time, whichever is chosen on the **GPS Time** page in the **Navigation** dialog box. The navigational information is available only if the relevant sensors are connected to the FX80 system.

The overlay appears during playback by default. You can also set it up so that the current overlay data is placed on top of the live feed during the presentation. When a video sequence is recorded, the selected overlay data is automatically added to the video file independent of the choices you have made in the **Overlay Settings** dialog box.

Procedure

- 1 Select the **Display** icon.



The icon is located under the **Main** menu.

- 2 Click the **Overlay Settings** button.



- 3 Check the boxes next to each item of information you wish to enable.
 - **Title:** Appears as entered at the top of the **Overlay Settings** dialog box.
 - **Date:** Provided by the computer clock.
 - **Time:** Provided by the computer clock.
 - **Position:** Vessel's geographical position as provided by the navigation system.
 - **Heading:** Vessel's current heading as provided by the navigation system.
 - **Speed:** Vessel's current speed as provided by the navigation system.
 - **Connection Speed:** Current speed of the connection between the Bridge Control Unit and the Communication Hub. The same connection speed is shown in the **Status Bar**.
- 4 If you wish to remove the video overlay from the live feed, check the **Hide overlay on live feed** box.
- 5 Use the **Layout** parameter to define how the video overlay shall appear on the video presentation — horizontal or vertically.
- 6 Select **OK** to save the selected settings and close the dialog box.

Related topics

[Overlay Settings dialog box, page 79](#)

Interfacing peripheral equipment

Topics

[Setting up the input from a navigation system \(GPS\), page 55](#)

[Synchronizing to the GPS clock, page 56](#)

Setting up the input from a navigation system (GPS)

In order to read navigational data (position, speed, distance and heading) from an external sensor, you must choose which interface port to use, and then which datagram(s) to read.

Context

Most global positioning system (GPS) receivers provide NMEA 0183 datagrams containing geographical latitude and longitude information, as well as current speed and sailed distance.

Several external sensors(GPS navigation, gyro compass etc) may be connected to the FX80 to provide information about the vessel's speed, position, heading and sailed distance. The FX80 must be set up to receive this information.

Procedure

- 1 Select the **Setup** icon.

The icon is located under the **Main** menu.



- 2 Select **Navigation** to open the dialog box.

The **Navigation** dialog box is located on the setup menu.

The **Navigation** dialog box controls which datagram to be imported from the navigation system to provide speed, heading and position information.

- 3 For each type of information, choose which datagram format to accept.
- 4 Select **OK** to save the selected settings and close the dialog box.
- 5 Click the **System Setup** button.



- 6 Open the **NMEA Sentences** page.

The **NMEA Connection** page allows you to set up the communication parameters for the interface line to the navigation system.

- 7 Choose the baud rate for the serial communication.
- 8 Select **OK** to save the selected settings and close the dialog box.

Related topics

[Navigation dialog box - NMEA Sentences page, page 87](#)

[System Setup dialog box - NMEA Connection page, page 97](#)

Synchronizing to the GPS clock

The information from the navigation normally contains time information in ZDA format. This time information can be used by the FX80 system for clock synchronization.

Context

If GPS Time has been enabled, the FX80 software will display the time directly received from the GPS regardless of the current computer time. If this function has been enabled and no GPS time is available, the FX80 software will continue displaying the computer time.

Whenever GPS time is displayed, the phrase NMEA is displayed to the left of the date and time.

Procedure

- 1 Make sure that the FX80 is connected to the GPS system.
- 2 Select the **Setup** icon.

The icon is located under the **Main** menu.



- 3 Select **Navigation** to open the dialog box.

The **Navigation** dialog box is located on the setup menu.

The **Navigation** dialog box controls which datagram to be imported from the navigation system to provide speed, heading and position information.

- 4 Open the **GPS Time** page.
- 5 Check the **Always display GPS time when available** box.
- 6 Select **OK** to save the selected settings and close the dialog box.

Related topics

[Navigation dialog box - GPS Time page, page 88](#)

User interface

Topics

[Display organization, page 58](#)

[Top bar overview, page 59](#)

[The FX80 menu system, page 64](#)

[Status bar, page 65](#)

Display organization

By default, the FX80 presentation covers the entire screen. The FX80 consists of specific visual elements that work together.



This FX80 screen capture shows you a typical operational situation.

A Top bar

The FX80 top bar is located at the top of the display presentation and stretches from the far left to the far right. The top bar gives you fast access to key functionality and navigational information. It provides buttons for hiding and showing the menu, making screen captures, opening the **Messages** dialog box, and opening context-sensitive help. And more importantly, from the top bar you can see when data recording is active.

B Video presentation

The largest part of the FX80 presentation is used to provide the video presentation. This can either be the live feed from the camera, or a replay of a previously recorded file.

During replay, the phrase “REPLAY” is shown in the **Status Bar** as a reminder.

C Menu system

The menu system is by default located on the right side of the FX80 presentation. To open one of the menus, select the relevant icon. On the top bar, use the **Menu** button to hide or show the menu.



D Status bar

The status bar is located at the bottom of the FX80 presentation.

Top bar overview

The FX80 top bar is located at the top of the display presentation and stretches from the far left to the far right. The top bar gives you fast access to key functionality and navigational information. It provides buttons for hiding and showing the menu, making screen captures, opening the **Messages** dialog box, and opening context-sensitive help. And more importantly, from the top bar you can see when data recording is active.



A Logo and product name

This information identifies the brand and the product.

B Menu button

Select this button to hide or show the menu.

C Screen Capture / Record

Select **Screen Capture** to make a copy of the current FX80 presentation. The **Record** indicator shows you when recording is active.

D Navigational information

These are not buttons, but separate read-outs that show useful information related to the vessel and/or FX80 navigation and operation. The information shown on the FX80 top bar must not be used for vessel navigation.

E Messages button

By flashing, the **Messages** button shows you that the FX80 has issued a message. The colour of the triangle reflects the severity of the most serious message. Select the button to open the **Messages** dialog box.

F Operating system buttons

The operating system buttons open the context-sensitive help, minimize and maximize the presentation window, and close the FX80 program.

Logo and product name

The brand logo and product name are shown on the left side of the top bar.

Description

This information identifies the brand and the product.



Double-click the logo to reduce the size of the FX80 presentation. Double-click one more time to return to full screen presentation.

Menu button

The **Menu** button is located on the left side of the top bar. This is an "on/off" button.

Description

Unless you need to make frequent changes to the operating parameters, you may want to hide the menu from the FX80 presentation. This will give you more space to view the video feed.



To hide the menu, select **Menu** on the top bar. To retrieve it, select **Menu** one more time.

Screen Capture button description

When you use the FX80 actively, you may need to make a screen capture to save an instantaneous image of the current presentation.

Description

Select **Screen Capture** to make a copy of the current video frame.



The screen captures you make are saved in .jpg format on the hard disk in the Processor Unit. To access the images you have saved, select **Screen Captures**. The **Screen Captures** function is located on the **Display** menu.

Record button description

The **Record** function allows you to record the video feed received by the camera. The data files can be played back on the FX80. The files can later be deleted, copied or moved to another storage device.

Description

Before you start recording, make sure that you have defined where you wish to store the data files. To configure the recording file location and file name, click **Setup**→**Video**.



To start recording, click the red **Record** icon. To stop recording, click the red **Record** icon one more time. You can also start and stop recording by clicking **Operation**→**Live Feed**→**Record**.

Note

Video data files will normally become very large. If you wish to record large amounts of FX80 data, make sure that you have enough space on your hard disk. Unless your Processor Unit is equipped with a very large disk, we recommend that you save the data to an external storage device. If the FX80 detects that you have less than 500 Mb available on your hard disk, it will automatically stop the recording and provide a message.

Navigational information

The navigational information is located in the middle of the top bar.

Description

These are not buttons, but separate read-outs that show useful information related to the vessel and/or FX80 navigation and operation.



Note

The information shown on the FX80 top bar must not be used for vessel navigation.

Geographical position read-out

When enabled, the vessel's current geographical position is shown on the top bar.

Prerequisites

Set up communication with the external GPS system using the **Navigation** dialog box and the **NMEA Connection** page in the **System Setup** dialog box. You can open both these dialog boxes from the **Setup** menu.



Description

If a positioning sensor (GPS) is connected to the FX80, the top bar can show you the vessel's geographical position in longitude and latitude.

Note

The information shown on the FX80 top bar must not be used for vessel navigation.

Heading read-out

When enabled, the vessel's current heading is shown on the top bar.

Prerequisites

Set up communication with the external GPS system using the **Navigation** dialog box and the **NMEA Connection** page in the **System Setup** dialog box. You can open both these dialog boxes from the **Setup** menu.



Description

If a heading sensor (gyro compass) is connected to the FX80 Processor Unit, the top bar may show you the vessel's current heading.

Note

The information shown on the FX80 top bar must not be used for vessel navigation.

Speed read-out

When enabled, the vessel's current speed is shown on the top bar.

Prerequisites

Set up communication with the external GPS system or speed sensor using the **Navigation** dialog box. You can open this dialog box from the **Setup** menu.



Description

When a speed log is connected to the FX80, the vessel's current speed can be presented in the user interface. By default, the vessel speed is shown in knots.

Messages button description

The **Messages** button is located on the right side of the top bar.

Description

A new message is flagged with the **Messages** button on the top bar. The button is flashing to draw your attention. The colour of the triangle reflects the severity of the most serious message.



- **Yellow:** This indicates a warning.
- **Red:** This indicates an alarm.

Select the button to open the **Messages** dialog box.

Help button description

The **Help** button is located on the right side of the top bar.

Description

Select this button to open the FX80 context-sensitive help. The help system opens on its start page.



The context sensitive on-line help is located in a single proprietary Microsoft® CHM file. This CHM file will run on any computer with a Microsoft operating system. You can also copy the CHM file to any tablet device if you have a reader application that supports the CHM format.

Note

Due to limitations defined by Microsoft®, CHM files will not open from websites and servers.

You navigate in the help file using the menu system on the left side as well as the interactive links within the document.

Tip

*Help is also available from the various dialog boxes in the FX80 user interface. Select **Help [?]** in the top right corner of a dialog box to open the context-sensitive help.*

Operating system button descriptions

The operating system function buttons are located on the right side of the top bar. The buttons are **Minimize**, **Maximize** and **Close**.

Minimize button

Select this button to minimize the entire FX80 presentation. The program is then only shown as an icon on the operating system taskbar. To reopen, select the button one more time.

**Maximize/Normalize button**

Select this button to change the size of the FX80 presentation window. To restore the presentation to its previous size, select the button one more time.

**Close button**

Select this button to close the FX80 program.



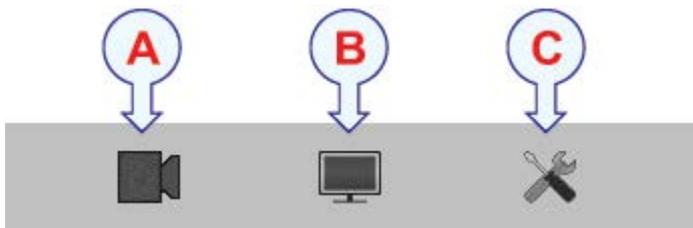
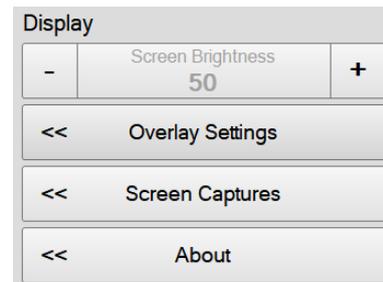
The FX80 menu system

The menu system is by default located on the right side of the FX80 presentation. Each menu provided by the FX80 contains several menu buttons. Some of the menu buttons open dialog boxes or submenus to offer additional choices.

Description

To select operational parameters on the FX80, use the menu system. Each menu provided by the FX80 contains several menu buttons. Each button shows the purpose of the button. Some of them also display the current setting.

To open one of the menus, select the relevant icon.



- A Operation menu:** The **Operation** menu offers the most common functions for basic FX80 operation.
- B Display menu:** The **Display** menu provides basic functions related to the screen behaviour and the presentation of the video information.
- C Setup menu:** The **Setup** menu provides basic functions related to the FX80 installation parameters and its communication with peripheral systems.

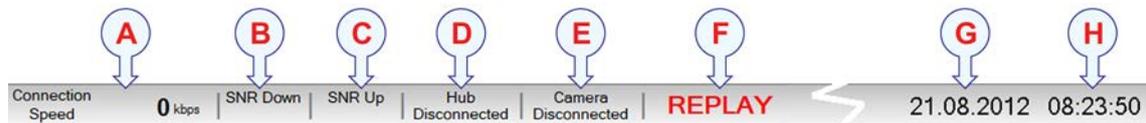
Tip

*Unless you need to make frequent changes to the operating parameters, you may want to hide the menu from the FX80 presentation. To hide the menu, select **Menu** on the top bar. To retrieve it, select **Menu** one more time.*



Status bar

The status bar is located at the bottom of the FX80 presentation. The status bar allows you to view the connection speed and system status.



A Connection Speed

This status message provides you with the current transmission speed between the Bridge Control Unit and the Communication Hub.

The same information is available on the **ADSL Router** page in the **System Setup** dialog box on the **Setup** menu.

B SNR Down

The Signal to Noise Ratio downstream value is shown here so you can monitor the connection quality.

C SNR Up

The Signal to Noise Ratio upstream value is shown here so you can monitor the connection quality.

D Hub

This message provides the status of the Communication Hub.

The same information is available on the **Hub Controller** page in the **System Setup** dialog box on the **Setup** menu.

E Camera

This message provides the status of the video camera.

F REPLAY

This text is provided to remind you that the current video presentation is a replay of a previously-recorded video file.

G Date

This field presents the current date.

During replay, the date of the replay file is shown. If the date and time are provided by the GPS system, "NMEA" is displayed in front of the date.

H Time

This field presents the current time.

During replay, the time of the replay file is shown.

Menu system

Topics

[About the menus and menu buttons, page 67](#)

[Using the "smart" menu buttons, page 67](#)

[Operation menu, page 68](#)

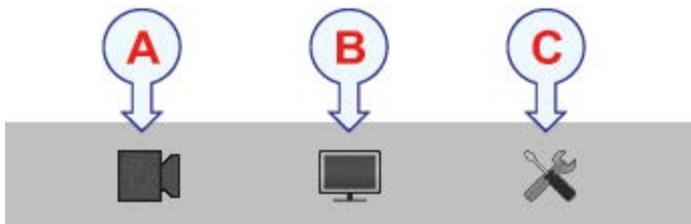
[Display menu, page 69](#)

[Setup menu, page 70](#)

About the menus and menu buttons

To select operational parameters on the FX80, use the menu system. Some of the menu buttons open dialog boxes or submenus to offer additional choices. The menu system is by default located on the right side of the FX80 presentation.

To open one of the menus, select the relevant icon.



- A Operation menu:** The **Operation** menu offers the most common functions for basic FX80 operation.
- B Display menu:** The **Display** menu provides basic functions related to the screen behaviour and the presentation of the video information.
- C Setup menu:** The **Setup** menu provides basic functions related to the FX80 installation parameters and its communication with peripheral systems.

Tip

Unless you need to make frequent changes to the operating parameters, you may want to hide the menu from the FX80 presentation. To hide the menu, select **Menu** on the top bar. To retrieve it, select **Menu** one more time.



Using the “smart” menu buttons

Each menu provided by the FX80 contains several menu buttons. Each button shows the purpose of the button. Some of them also display the current setting.

Depending on the properties of each individual button, several methods can be used to change settings.

- Select the *left* side of the button to *decrease* the numerical value. Select the *right* side of the button to *increase* the numerical value.
- Press and hold the left mouse button. Move the cursor *right* to increase the value. Move the cursor *left* to decrease the value.
- Spin the scroll wheel in either direction to increase or decrease the numerical value.
- You can type settings using a computer keyboard (if you have one connected to your Processor Unit).
- Select the button to open the button menu. Choose the required setting.
- Select the button to open the dialog box.



Choosing a setting with the [+] and [-] buttons

- 1 To change the setting, move the cursor to either side of the button.
- 2 Observe that the background colour changes.
 - a Select the *left* side of the button to *decrease* the numerical value.
 - b Select the *right* side of the button to *increase* the numerical value.

Selecting parameters using a dialog box



Click anywhere on the button to open a separate dialog box. When the necessary changes have been made:

- Select **OK** to save the selected settings and close the dialog box.
- Select **Cancel** to close the dialog box without making any changes.

Operation menu

The **Operation** menu offers the most common functions for basic FX80 operation.

How to open

Select the **Operation** icon.



The icon is located under the **Main** menu. Select the icon one more time to close the menu.

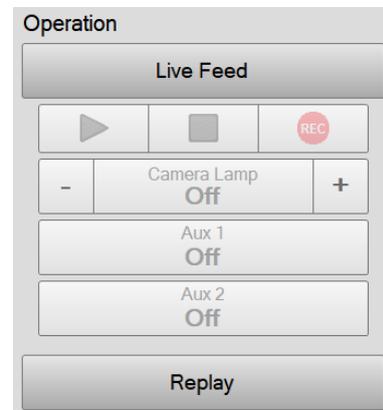
Description

- **Live Feed**

The **Live Feed** functions allow you to control the presentation of the video information from the camera. Several additional functions are provided when the **Live Feed** is activated.

- **Replay**

The **Replay** functions allow you to control the presentation of the video information that has been recorded on the FX80 Processor Unit computer during previous sessions. Several additional functions are also provided when the **Replay** is activated.



Display menu

The **Display** menu provides basic functions related to the screen behaviour and the presentation of the video information.

How to open

Select the **Display** icon.



The icon is located under the **Main** menu. Select the icon one more time to close the menu.

Description

- **Screen Brightness**

The intensity of the light given off by the FX80 presentation can be adjusted. You can use this function to increase or decrease the light from the screen to match the ambient light.

- **Overlay Settings**

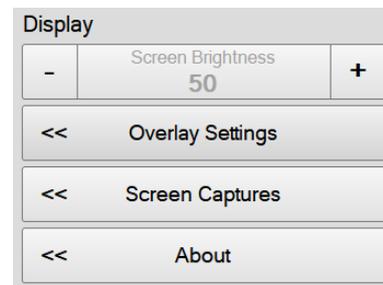
The **Overlay Settings** dialog box allows you to place information (date, location, etc.) on top of the video presentation during playback and/or the live feed.

- **Screen Captures**

The **System Setup** dialog box allows you to define the main functional parameters for the FX80 system. The **Video Encoder** page allows you to define the main parameters for live feed, video recording and playback.

- **About**

The **About** dialog box identifies the current FX80 software version with its release date. This dialog box also identifies the software version, product number, and serial number for both the Communication Hub and the FX80 camera.



Setup menu

The **Setup** menu provides basic functions related to the FX80 installation parameters and its communication with peripheral systems.

How to open

Select the **Setup** icon.



The icon is located under the **Main** menu. Select the icon one more time to close the menu.

Description

- **Video**

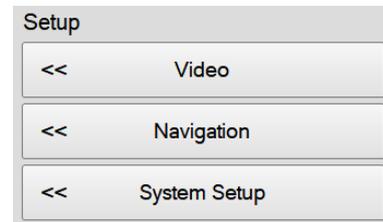
The **Video** dialog box allows you to control the file locations and file names for the video and screen capture files.

- **Navigation**

The **Navigation** dialog box controls which datagram to be imported from the navigation system to provide speed, heading and position information.

- **System Setup**

The **System Setup** dialog box allows you to define the main functional parameters for the FX80 system. These settings include the video encoder, NMEA interfaces, and ADSL router parameters.



Functions and dialog boxes

Topics

[Operation menu: Functions and dialog boxes, page 72](#)

[Display menu: Functions and dialog boxes, page 78](#)

[Setup menu: Functions and dialog boxes, page 84](#)

[Messages dialog box, page 101](#)

Operation menu: Functions and dialog boxes

Topics

[Live Feed function, page 73](#)

[Replay function, page 75](#)

Live Feed function

The **Live Feed** functions allow you to control the presentation of the video information from the camera. Several additional functions are provided when the **Live Feed** is activated. You can start and stop video recording. You can also control the intensity of the lamp, or switch it off.

How to open

This function is opened from the **Operation** menu. Select **Live Feed** to open the video functions.



Description

The main purpose of the FX80 is to provide a real-time video feed from the chosen location on the fishing net. Provided that the FX80 units have been powered up with the necessary items correctly positioned, you can easily start and stop the video feed.

The largest part of the FX80 presentation is used to provide the video presentation. This can either be the live feed from the camera, or a replay of a previously recorded file. The controls provided are similar to those used on any commercial playback equipment.



Once the video is active, you can also record the feed to a file on the computer. The file name and location is selected using the **Video** dialog box on the **Setup** menu.

A dedicated button is provided to control the intensity of the lamp on the camera, or switch it on and off.



The two **Aux** buttons allow you to establish communication with other systems, such as the DFS75 Trawl Sonar.



Details

Start video feed

The play controls provided offer a dedicated button to start the video feed. Click the left button [▶] to start the video feed.

During the live feed presentation, you can click the left button [▶] one more time to pause the video feed. The symbol in the button then changes to a "pause" icon. To restart the live feed, click this icon.

Tip

If you have started a recording, pausing the live feed will not pause the recording — it will continue normally in the background.

Stop video feed

The play controls provided offer a dedicated button to stop the video feed. Select the middle button [■] to stop the live video feed.

Start recording

The play controls provided offer a dedicated button to record the video feed. To start recording, click the red **Record** icon.

The video stream is automatically recorded to the file location you have chosen in the **Video** dialog box on the **Setup** menu.

To stop the recording, click the [**REC**] button one more time.

Tip

*You can also start and stop the recording using the [**REC**] button on the top bar.*

Video data files will normally become very large. If you wish to record large amounts of FX80 data, make sure that you have enough space on your hard disk. Unless your Processor Unit is equipped with a very large disk, we recommend that you save the data to an external storage device. If the FX80 detects that you have less than 500 Mb available on your hard disk, it will automatically stop the recording and provide a message.

Camera Lamp

Use this button to control the intensity of the lamp, or to switch it on or off. Click the middle of the **Camera Lamp** button to switch the light off or on. Click either side ([+] and [-]) of the **Camera Lamp** button to decrease and increase the intensity of the light. To read the current level, observe the information provided on the **Hub Controller** page in the **System Setup** dialog box.

Tip

Different fish species seem to react differently to the light. The light can therefore modify fish behaviour.

Aux 1 / Aux 2

Each **Aux** button on the **Operation** menu allows you to remotely enable or disable the relevant auxiliary interface connector on the Communication Hub inside the Trawl Unit. These auxiliary connectors are used to establish communication with additional equipment that may be in use, such as the DFS75 Trawl Sonar. The interface parameters are defined on the **Aux 1** and **Aux 2** pages in the **System Setup** dialog box.

Note

The information provided by any instrument connected to the auxiliary connectors have no effect on the live video feed.

Related topics

[Starting the live video feed, page 48](#)

[Controlling the ambient light conditions for the camera, page 48](#)

[Recording video sequences, page 49](#)

Replay function

The **Replay** functions allow you to control the presentation of the video information that has been recorded on the FX80 Processor Unit computer during previous sessions. Several additional functions are also provided when the **Replay** is activated.

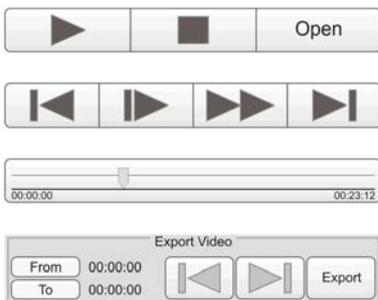
How to open

This function is opened from the **Operation** menu. Click the **Replay** button to open the playback functions.



Description

The **Replay** function allows you to recall any previously recorded video file to see it one more time.



During replay, the phrase "REPLAY" is shown with red characters at the bottom of the FX80 presentation.

The **Replay** functionality also allows you to export video.

Details

Start video playback

The replay controls provided offer a dedicated button to start the video playback. Click the **Play** button [▶] to start the playback.

During the playback, you can click the **Play** button [▶] one more time to pause the video. The symbol in the button then changes to a **Pause** button. To restart the playback, click one more time.

Stop video playback

The replay controls provided offer a dedicated button to stop the video playback. To stop the playback, click the **Stop** button [■].

Open

Click the **Open** button to open the video file you wish to play back. A standard operating system dialog box opens to let you choose the folder and file.

Playback controls

Dedicated replay control buttons are available to control the progress of the playback.

The controls are (from left):

- Jump to start of video file
- Play slow
- Play fast
- Jump to end of video file

Progress bar

The progress bar is provided to offer a visual presentation of the progress. You can click on the small arrow and drag it in horizontal direction to move the view in the video file.

Export Video

The **Export Video** functionality allows you to export the video sequences – either in full or an excerpt – you have recorded on the FX80 to another video format.

To select the start of the video clip to exported, move the small arrow on the progress bar horizontally until the requested frame is shown, then click **From**. To select the end of the video clip to exported, move the small arrow on the progress bar horizontally until the requested frame is shown, then click **To**. Click the two arrow buttons to jump between the first and last selected frame.

Note

*It is not possible to export video clips that are shorter than 10 seconds, unless the original file is this short. This means that the start and end point of the chosen sequence cannot be less than 10 seconds apart. If the values you select for **From** and **To** are too close together, the FX80 software will correct them for you, and place them 10 seconds apart.*

Click the **Export** button to save the selected video sequence. A standard operating system dialog box opens to let you select the file name and folder. You can only save in .avi format.

Related topics

[Replaying previously recorded video sequences, page 50](#)

[Exporting video recordings, page 51](#)

Display menu: Functions and dialog boxes

Topics

[Screen Brightness function, page 79](#)

[Overlay Settings dialog box, page 79](#)

[System Setup dialog box, page 82](#)

[About dialog box, page 82](#)

Screen Brightness function

The intensity of the light given off by the FX80 presentation can be adjusted. You can use this function to increase or decrease the light from the screen to match the ambient light.



How to open

This function is activated on the **Display** menu.

Description

When the bridge is dark, the light emitted by the FX80 display can affect your night vision. In order to compensate for this, you can reduce the intensity. The **Screen Brightness** function allows you to reduce the brightness, and hence make the presentation darker. The intensity of light emitted by the display can be reduced from 100% to 0% in steps of 10.

To change the setting, move the cursor to either side of the button, and observe that the background colour changes. Select [—] on the left side to decrease the value, or select [+] on the right side to increase the value.

Related topics

[Reducing the light emitted from the display presentation, page 40](#)

Overlay Settings dialog box

The **Overlay Settings** dialog box allows you to place information (date, location, etc.) on top of the video presentation during playback and/or the live feed.

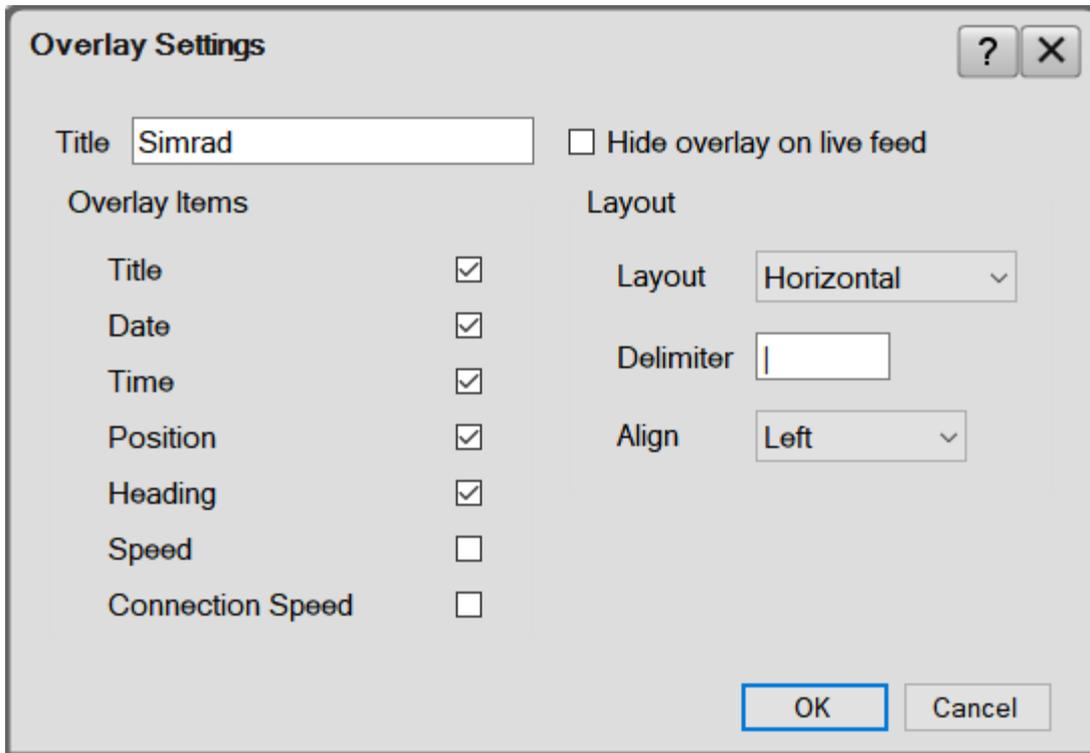
How to open

This dialog box is opened from the **Display** menu. Click the **Overlay Settings** button.



Description

The overlay information is automatically extracted from the recorded file. The information includes title, date and time, as well as navigational information.



The date and time information is derived from the computer clock, or the GPS time, whichever is chosen on the **GPS Time** page in the **Navigation** dialog box. The navigational information is available only if the relevant sensors are connected to the FX80 system.

The overlay appears during playback by default. You can also set it up so that the current overlay data is placed on top of the live feed during the presentation. When a video sequence is recorded, the selected overlay data is automatically added to the video file independent of the choices you have made in the **Overlay Settings** dialog box.

Details

Title

Enter any text to place it as a title on top of the video presentation.

Overlay Items

Select which information items shall be added to the video presentation. All information was automatically recorded simultaneously with the video data.

- **Title:** Appears as entered at the top of the **Overlay Settings** dialog box.
- **Date:** Provided by the computer clock.
- **Time:** Provided by the computer clock.
- **Position:** Vessel's geographical position as provided by the navigation system.
- **Heading:** Vessel's current heading as provided by the navigation system.
- **Speed:** Vessel's current speed as provided by the navigation system.
- **Connection Speed:** Current speed of the connection between the Bridge Control Unit and the Communication Hub. The same connection speed is shown in the **Status Bar**.

Hide overlay on live feed

Check the box to hide the overlay information from the live feed presentation.

Note

*Overlay items that have been selected will still be overlaid on the recording, but hidden on the live feed. On the live feed, this information is already provided on the top bar and the **Status Bar**.*

Layout

Three options are provided to change the layout of the overlay data presentation.

- **Horizontal/Vertical:** Change the orientation of the overlay text on the presentation.
- **Delimiter:** Change which character to be used between each overlay item on the horizontal presentation (for example, `Title | Date Time | Position | . . .`). The vertical presentation does not use delimiters.
- **Align:** Choose whether the text will be aligned left, right, or centred.

Related topics

[Enabling video overlays, page 52](#)

System Setup dialog box

The **System Setup** dialog box allows you to define the main functional parameters for the FX80 system. These settings include the video encoder, NMEA interfaces, and ADSL router parameters.

How to open

This dialog box is opened from the **Setup** menu. Click the **System Setup** button.



This dialog box can also be opened from the **Display** menu. Select **Screen Captures**.



Description

The **System Setup** dialog box provides six pages.

- The **Video Encoder** page allows you to define the main parameters for live feed, video recording and playback.
- The **ADSL Router** page allows you to monitor the status of the ADSL Router, and hence the communication between the Bridge Control Unit and the Communication Hub in the Trawl Unit.
- The **Hub Controller** page allows you to monitor the status of the Communication Hub in the Trawl Unit. This page also allows you to compensate for signal loss if you need to use a long fourth-wire cable between the Communication Hub and the Camera Unit.
- The **NMEA Connection** page allows you to set up the communication parameters for the interface line to the navigation system.
- The two **Aux** pages allow you to define the parameters for the auxiliary inputs.

Related topics

[System Setup dialog box - Video Encoder page, page 90](#)

[System Setup dialog box - ADSL Router page, page 92](#)

[System Setup dialog box - Hub Controller page, page 94](#)

[System Setup dialog box - NMEA Connection page, page 97](#)

[System Setup dialog box - Aux pages, page 99](#)

About dialog box

The FX80 program is released with a specific software version. The **About** dialog box displays the current version number. The version described in this Reference Manual is 2.3.1.



How to open

This dialog box is opened from the **Display** menu. Click the **About** button.

Description

Every FX80 software release is uniquely identified. The **About** dialog box identifies the current FX80 software version with its release date.

Tip

If you wish to find the latest software version for the FX80, check our website.

This dialog box also identifies the software version, product number, and serial number for both the Communication Hub and the FX80 camera.

Setup menu: Functions and dialog boxes

Topics

[Video dialog box, page 85](#)

[Navigation dialog box, page 86](#)

[System Setup dialog box, page 82](#)

Video dialog box

The **Video** dialog box allows you to control the file locations and file names for the video and screen capture files.

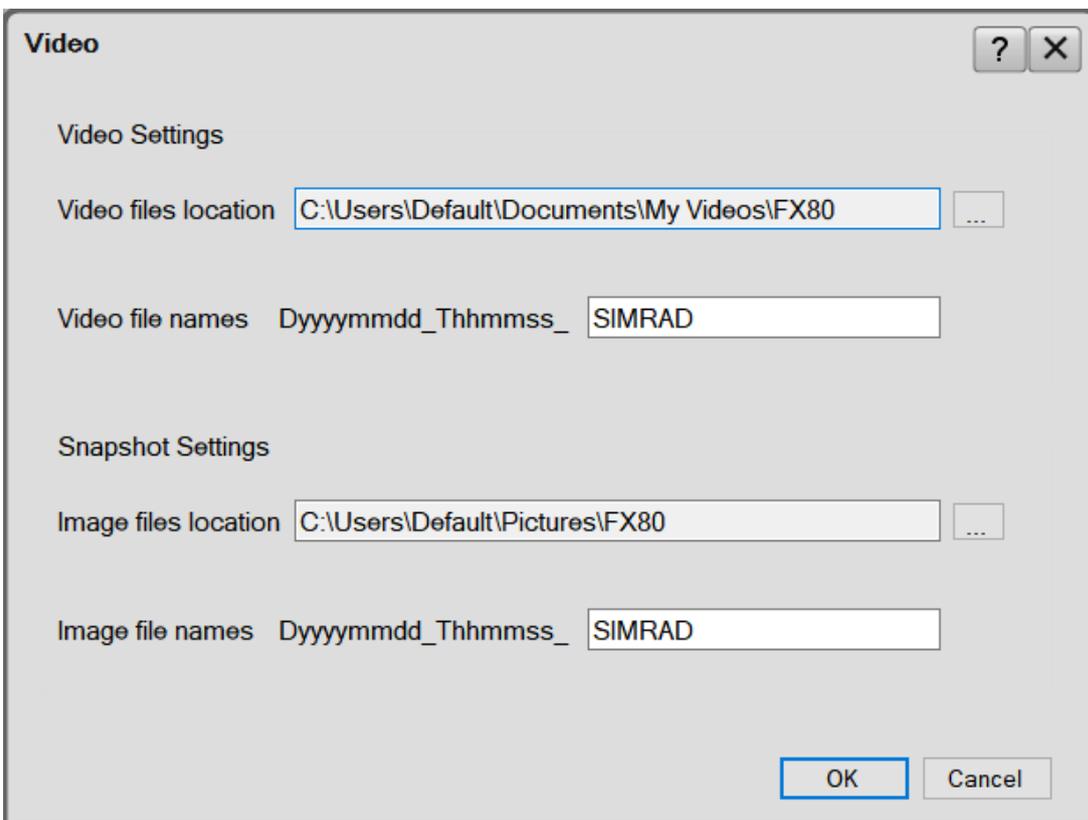
How to open

This dialog box is opened from the **Setup** menu. Click the **Video** button.



Description

When video files and screen captures are saved, they must be placed in a chosen folder on the computer's hard drive. For easy retrieval, they must also be identified with a file name. The folder location for each of these files can be defined in the **Video** dialog box.



The file names automatically include year, month, day, and time. You can define the last part of the file name to include your own information.

Note

All video files are saved in .avi format.

All screen capture files are saved in .jpeg format. Only the current video frame is saved, not the entire FX80 display presentation.

Details

Video files location

Specify the folder for the recorded video files. Click the button on the right side of the text field to open an operating system browser dialog box.

Video file names

Specify the last part of the file names.

Image files location

Specify the folder for the recorded screen capture files. Click the button on the right side of the text field to open an operating system browser dialog box.

Image file names

Specify the last part of the file names.

Navigation dialog box

The **Navigation** dialog box controls which datagram to be imported from the navigation system to provide speed, heading and position information.

How to open

This dialog box is opened from the **Setup** menu. Click the **Navigation** button.



Description

Several external sensors(GPS navigation, gyro compass etc) may be connected to the FX80 to provide information about the vessel's speed, position, heading and sailed distance. The FX80 must be set up to receive this information. The interface port is fixed, but the format of the information must be selected. The **Navigation** dialog box provides dedicated tabs to set up these parameters.

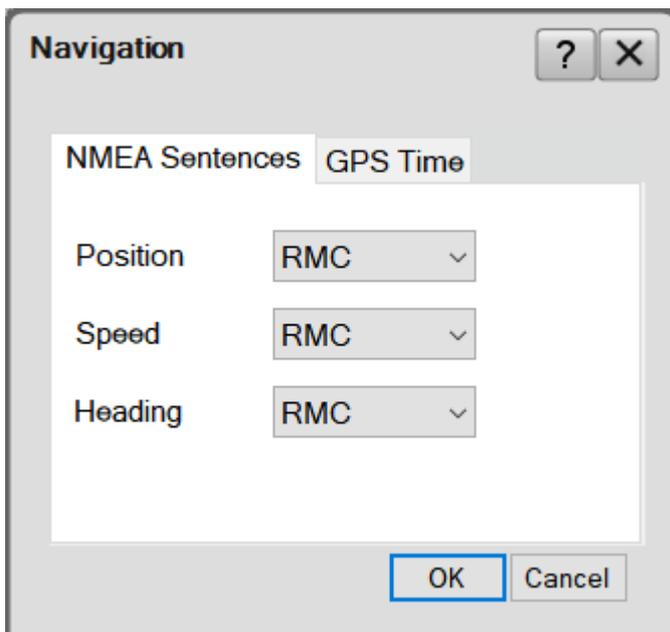
The ship's navigation system is connected to the Bridge Control Unit using a serial port. This connects directly to an NMEA converter that transmits data as UDP packets. These packets - containing the navigation information - are sent to the FX80 Processor Unit on the Ethernet line. You can not change any of the serial line communication parameters in the FX80 user interface. These are fixed to the standard NMEA settings.

Navigation dialog box - NMEA Sentences page

The parameters on the **NMEA Sentences** page allows you to choose which information datagrams will be read from the navigation system to provide position, speed, and heading information.

Description

For each type of information from the navigation system, you can choose which NMEA datagrams to import.



Details

Position

Select which NMEA sentence to be used to import position information.

- NMEA GGA

The NMEA GGA datagram transfers time-, position- and fix-related data from a global positioning system (GPS).

- NMEA GLL

The NMEA GLL datagram transfers the latitude and longitude of vessel position, the time of the position fix and the current status from a global positioning system (GPS).

- NMEA RMC

The NMEA RMC datagram transfers the time, date, position, course and speed data from a global navigation satellite system (GNSS) receiver.

Speed

Select which NMEA sentence to be used to import speed information.

- NMEA RMC

The NMEA RMC datagram transfers the time, date, position, course and speed data from a global navigation satellite system (GNSS) receiver.

- NMEA VTG

The NMEA VTG datagram contains the actual course and speed relative to the ground.

Heading

Select which NMEA sentence to be used to import heading information.

- NMEA HDT

The NMEA HDT datagram provides the true vessel heading. The information is normally provided by a course gyro.

- NMEA RMC

The NMEA RMC datagram transfers the time, date, position, course and speed data from a global navigation satellite system (GNSS) receiver.

- NMEA VTG

The NMEA VTG datagram contains the actual course and speed relative to the ground.

Related topics

[Setting up the input from a navigation system \(GPS\), page 55](#)

Navigation dialog box - GPS Time page

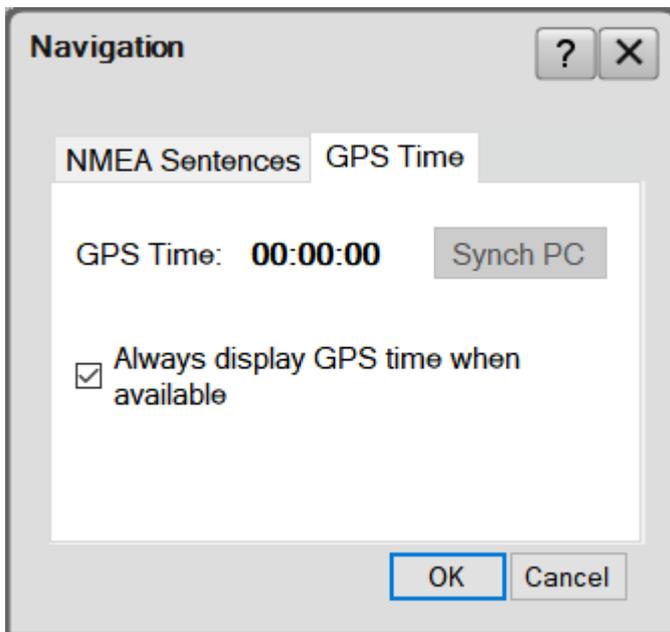
The parameters on the **GPS Time** page allows you to read the clock information from the navigation system, and to synchronize the computer clock to this information.

Description

The information from the navigation normally contains time information in ZDA format. This time information can be used by the FX80 system for clock synchronization.

If GPS Time has been enabled, the FX80 software will display the time directly received from the GPS regardless of the current computer time. If this function has been enabled and no GPS time is available, the FX80 software will continue displaying the computer time.

Whenever GPS time is displayed, the phrase NMEA is displayed to the left of the date and time.



Details

GPS Time

The current time provided by the navigation system (in ZDA format).

Synch PC

Click this button to synchronize the computer clock to the GPS time.

Always display GPS time when available

Click this button to enable this feature.

Related topics

[Synchronizing to the GPS clock, page 56](#)

System Setup dialog box

The **System Setup** dialog box allows you to define the main functional parameters for the FX80 system. These settings include the video encoder, NMEA interfaces, and ADSL router parameters.

How to open

This dialog box is opened from the **Setup** menu. Click the **System Setup** button.



This dialog box can also be opened from the **Display** menu. Select **Screen Captures**.



Description

The **System Setup** dialog box provides six pages.

- The **Video Encoder** page allows you to define the main parameters for live feed, video recording and playback.
- The **ADSL Router** page allows you to monitor the status of the ADSL Router, and hence the communication between the Bridge Control Unit and the Communication Hub in the Trawl Unit.
- The **Hub Controller** page allows you to monitor the status of the Communication Hub in the Trawl Unit. This page also allows you to compensate for signal loss if you need to use a long fourth-wire cable between the Communication Hub and the Camera Unit.
- The **NMEA Connection** page allows you to set up the communication parameters for the interface line to the navigation system.
- The two **Aux** pages allow you to define the parameters for the auxiliary inputs.

Related topics

[System Setup dialog box - Video Encoder page, page 90](#)

[System Setup dialog box - ADSL Router page, page 92](#)

[System Setup dialog box - Hub Controller page, page 94](#)

[System Setup dialog box - NMEA Connection page, page 97](#)

[System Setup dialog box - Aux pages, page 99](#)

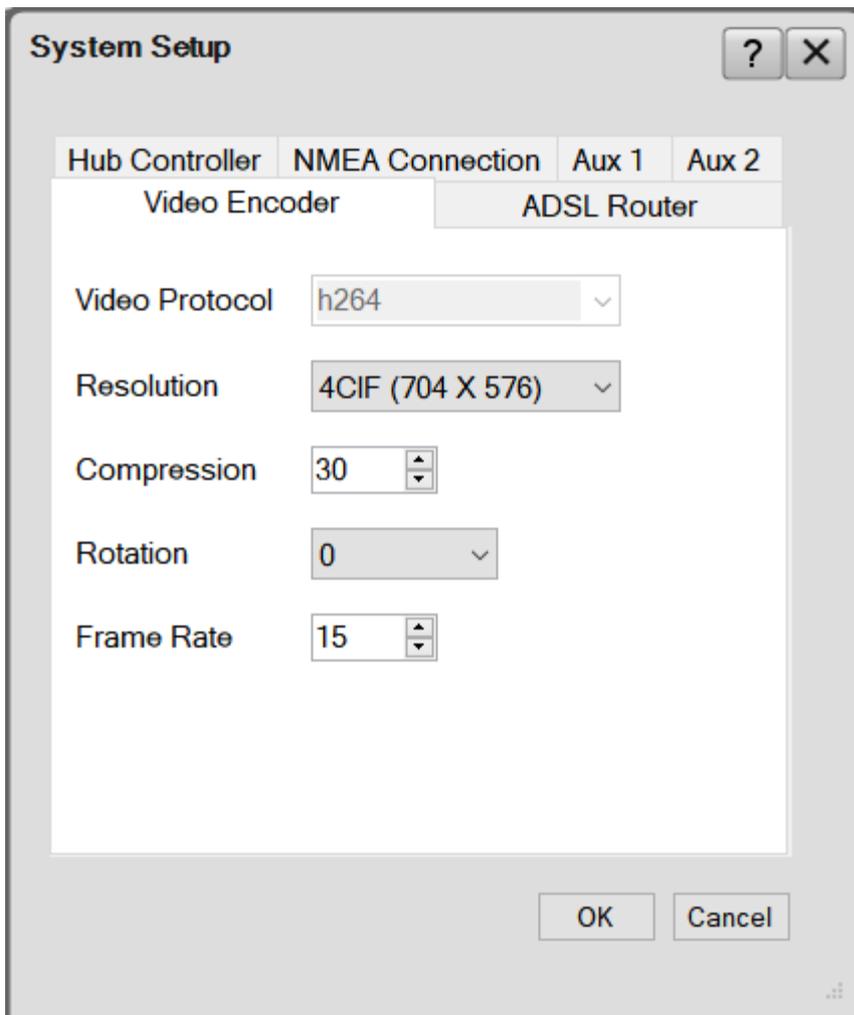
System Setup dialog box - Video Encoder page

The **Video Encoder** page allows you to define the main parameters for live feed, video recording and playback.

Description

Whenever digital video is shown on a computer, various data formats for presentation and recording are available. These formats are known as ‘protocols’, and several standards are provided for different video purposes and systems. A range of small computer programs – ‘codecs’ – are used to decode the video information from the protocols and present them on the screen.

Video consumes a lot of digital space, and raw video will soon fill a hard disk. For this reason, the video protocols provide different ways of compressing the information. Such video compression uses a coding technique to reduce redundancy in the video data, and thus reducing the file size. Large amounts of data may be eliminated while being perceptually indistinguishable. However, as in all compression, there is a trade-off between video quality, file size, and system requirements. Highly compressed video may present visible or distracting artifacts.



Details

Video Protocol

The video protocol is presently fixed to *h264*.

H.264 (also known as MPEG-4 Part 10 or AVC (Advanced Video Coding)) is a standard for video compression. It is currently one of the most commonly used formats for the recording, compression, and distribution of high definition video. H.264 is perhaps best known as being one of the standards for Blu-ray discs. It is also widely used by streaming internet sources, such as videos from Vimeo, YouTube, and the iTunes Store.

Presently, only the *h264* protocol is available.

Resolution

This parameter is used to determine video resolution during the live feed and recording.

The resolution provided by the camera is higher than the options you are provided with here. However, the length and quality of your trawl cable may have a negative effect on the video feed, and reduce the video quality. To reduce the strain, you may need to reduce the resolution, as this will reduce the amount of video data to be transferred from the camera up to the computer.

Compression

This parameter allows you to define the video compression.

A higher integer provides higher compression, but will also introduce more lag in the video feed. For best video quality, use a low number. The default value is 30, which is a good trade-off.

Rotation

If the camera mounted on the gear is not placed horizontally, you can compensate for this using the **Rotation** parameter.

Frame Rate

Frame rate (also known as ‘frame frequency’) is the frequency (rate) at which an imaging device produces unique consecutive images called frames. Our brain can process 10 to 12 separate images per second, perceiving them individually. If you reduce the frame rate, you will see a loss of quality in the video, but the file size will be smaller when you are making a recording.

Unless you have special requirements, use the default value of 15 frames per second.

Related topics

[Optimizing video performance, page 43](#)

[Compensating for camera rotation, page 44](#)

System Setup dialog box - ADSL Router page

The **ADSL Router** page allows you to monitor the status of the ADSL Router, and hence the communication between the Bridge Control Unit and the Communication Hub in the Trawl Unit.

Description

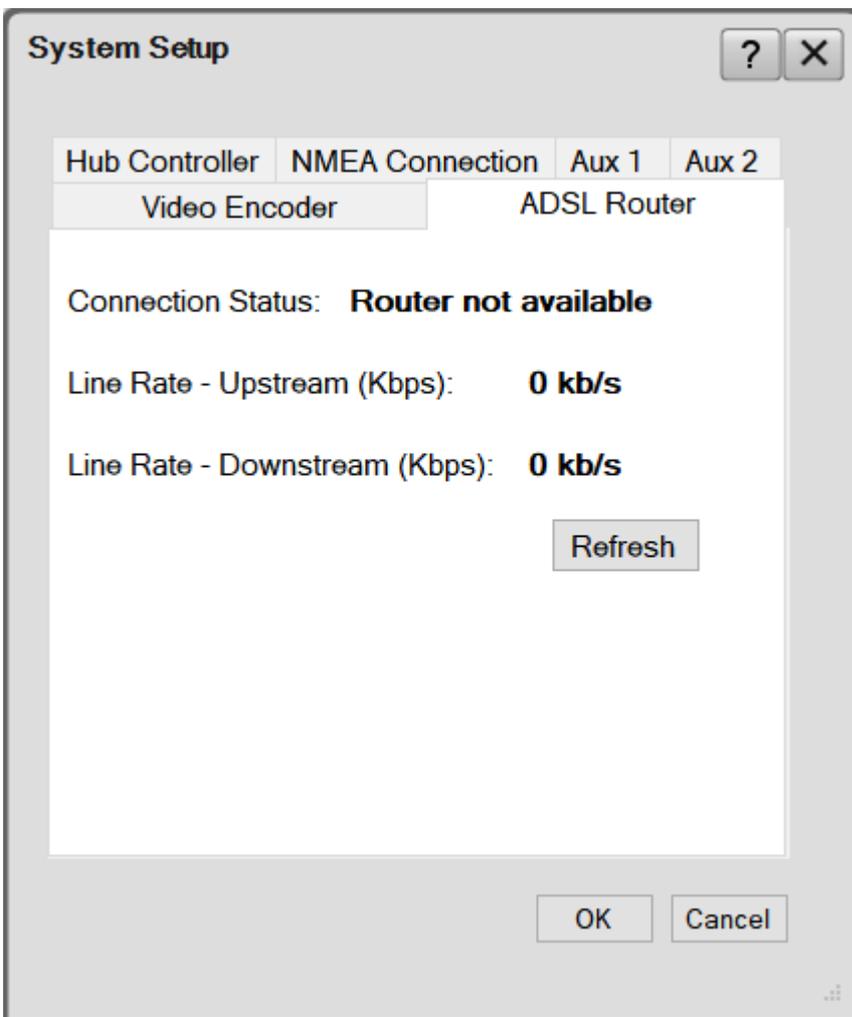
Asymmetric Digital Subscriber Line (ADSL) is a data communications technology that enables faster data transmission over copper lines.

ADSL Routers are key components in the FX80 system, as they handle the data communication on the trawl cable between the Bridge Control Unit and the subsea

equipment on the gear. One router is physically located inside the Bridge Control Unit, while a similar router is incorporated in the Communication Hub in the Trawl Unit.

Tip

You will see that the line rates will gradually decrease with time. If the line rates sink below 500 Kbps upstream and 1000 Kbps downstream, the communication has degraded so much that corrective actions may be required. To rectify, you may need to reduce the resolution and/or the frame rate. You should also check the slip ring, the general quality of the third-wire cable, and specifically the pigtail and the splicing.



Details

Connection Status

This field displays the current operational status of the ADSL Router.

- **Up:** The ADSL Router is connected to the Communication Hub, and the communication is operational.
- **ADSL Link Down:** The communication between the Processor Unit and the ADSL Router inside the Bridge Control Unit is operational, but the communication with the ADSL Router in the Communication Hub is not serviceable.
- **Router not available:** There is no network connection between the Processor Unit and the ADSL Router inside the Bridge Control Unit. The system is not operational.

Make sure the Bridge Control Unit is switched on.

Line Rate - Upstream

This is the current communication speed from the Bridge Control Unit to the Communication Hub in the Trawl Unit. The same information is provided on the **Status Bar** in the bottom-left corner of the FX80 presentation.

Line Rate - Downstream

This is the current communication speed from the Communication Hub in the Trawl Unit to the Bridge Control Unit.

Refresh

Click this button to refresh the information provided on the page.

Related topics

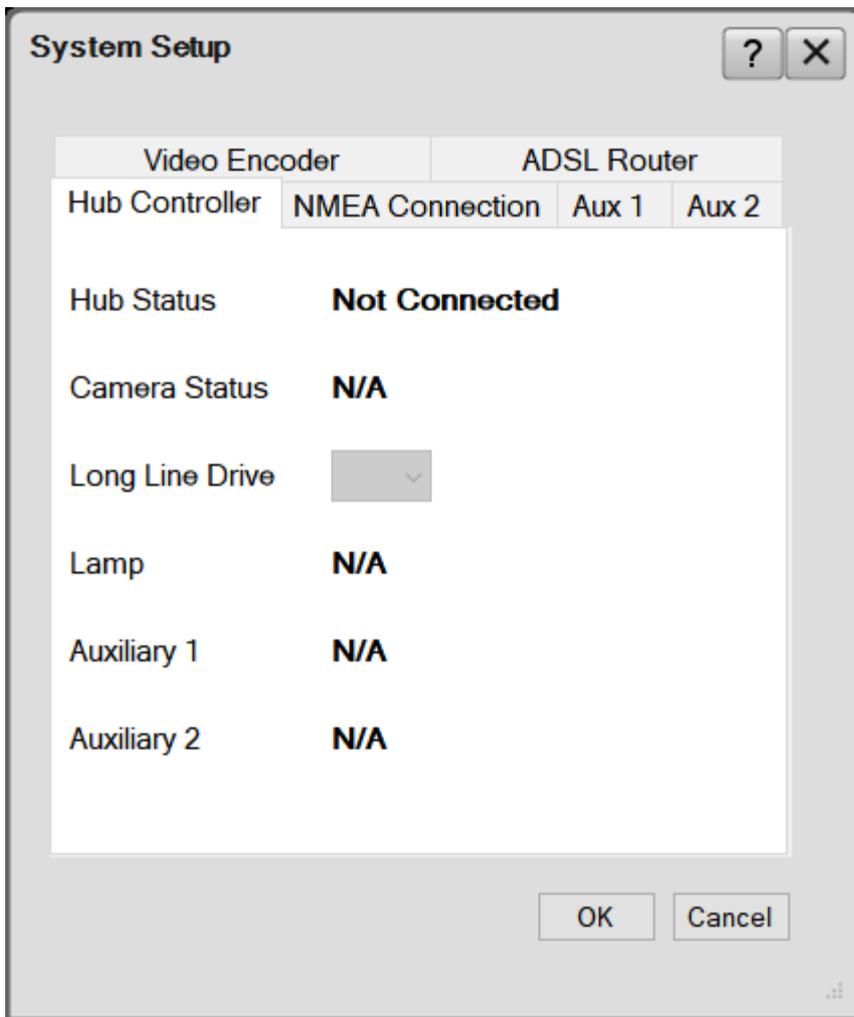
[Monitoring the communication link, page 40](#)

System Setup dialog box - Hub Controller page

The **Hub Controller** page allows you to monitor the status of the Communication Hub in the Trawl Unit. This page also allows you to compensate for signal loss if you need to use a long fourth-wire cable between the Communication Hub and the Camera Unit.

Description

The Communication Hub is physically located in the Trawl Unit. It acts as a central connection point for all the subsea equipment used with the FX80 system, and controls the communication between these units and the Bridge Control Unit.



Details

Hub Status

This field shows you the current status of the Communication Hub.

- **Connected:** The Communication Hub is connected to the Bridge Control Unit and it is active and operational.
- **Not Connected:** The Communication Hub is not connected to the Bridge Control Unit. The system is not operational. In this case, all other statuses will be set to “N/A” due to the lack of communication.

Camera Status

This field shows you the current status of the camera.

- **Authenticated:** The camera is connected to the Communication Hub and is active and operational.
- **Not Authenticated:** The camera is either not connected to the Communication Hub, or you have attempted to connect a third-party camera. The camera supplied with the FX80 system is constantly polled by the Communication Hub with an authentication request. Other third-party cameras can therefore not be used.
- **N/A:** The Communication Hub is not communicating with the Bridge Control Unit. The availability of the camera is therefore unknown. The system is not operational.

Lamp

This field shows you the current status of the lamp.

- **Off:** The lamp is switched off.
- **On (n%):** The lamp is switched on. The current intensity is indicated as a percentage.
- **N/A:** The Communication Hub is not communicating with the Bridge Control Unit. The availability of the lamp is therefore unknown. The system is not operational.

Auxiliary 1 and Auxiliary 2

These fields show you the current status of the auxiliary inputs.

- **Off:** The auxiliary connection is switched off and not used.
- **On:** The auxiliary connection is switched on and operating.
- **N/A:** The Communication Hub is not communicating with the Bridge Control Unit. The availability of the auxiliary inputs is therefore unknown. The system is not operational.

Long Line Drive

If the Camera Unit is physically located some distance from the Trawl Unit on the headrope, this distance will require a long fourth-wire cable between the two units. On larger trawls, the cable may need to be several hundred meters long.

Unfortunately, a long cable will always result in some signal loss, and such loss is annoying on any video system. In order to compensate for a long cable, the FX80 offers the **Long Line Drive** parameter. Using this parameter, you can enter the approximate length of the cable, so that the software can compensate automatically.

The following options are available.

- **'n' m**: Approximate length of fourth-wire cable.
- **1200*m**: Special configuration for very long cable.
- **1200#m**: Special configuration for very long cable.

Related topics

[Compensating for fourth-wire signal loss, page 45](#)

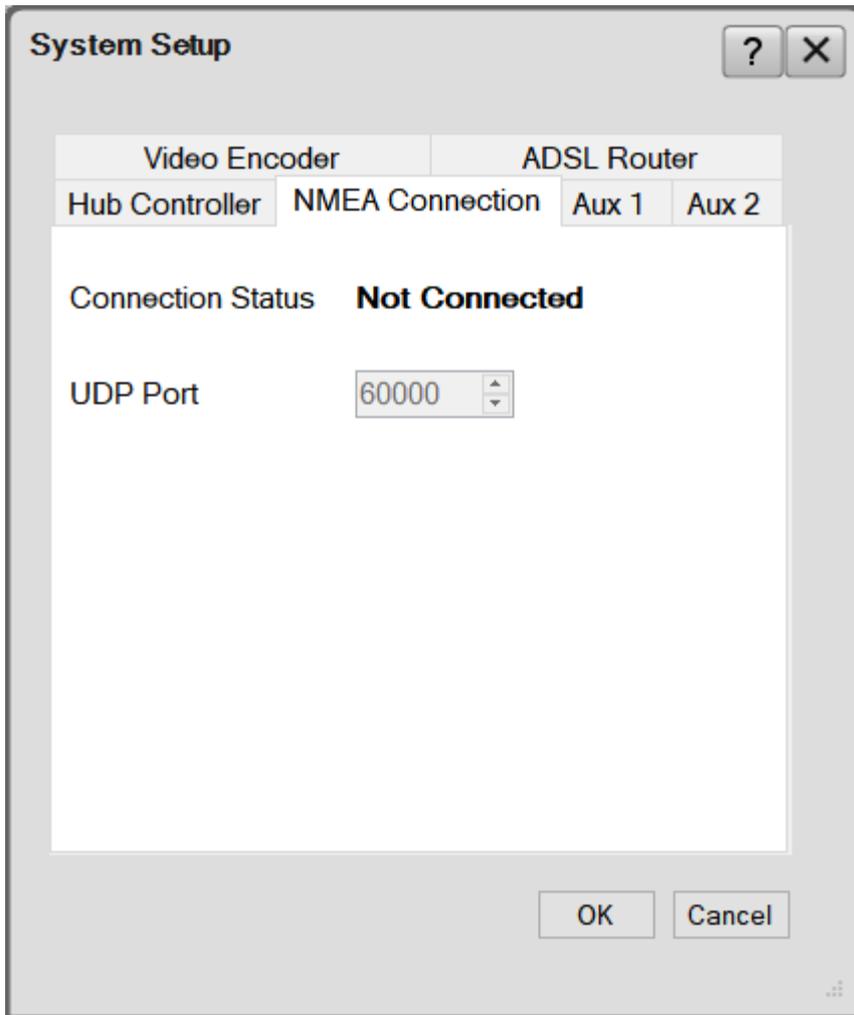
System Setup dialog box - NMEA Connection page

The **NMEA Connection** page allows you to set up the communication parameters for the interface line to the navigation system.

Description

The ship's navigation system is connected to the Bridge Control Unit using a serial port. An NMEA converter then transmits the ship's navigation data as UDP packets. These UDP packets are sent to the FX80 Processor Unit on the Ethernet line.

The only NMEA parameter that can be changed in this dialog box is the baud rate. A small percentage of commercial navigation systems use a 9600 baud rate instead of the standard 4800.



Details

Connection Status

This field shows you the current status of the navigation input.

UDP Port

The NMEA converter in the Bridge Control Unit uses a UDP port to transmit information to your computer. The computer's input port must match the output port on the converter. Refer to this field to set up the interface ports on both the computer and the NMEA converter in the Bridge Control Unit simultaneously.

Unless you have specific requirements, use the default value.

NMEA Baud Rate

If the remote navigation system transmits its information on a baud rate different from the standard 4800 setting, you can specify it here.

Related topics

[Setting up the input from a navigation system \(GPS\), page 55](#)

System Setup dialog box - Aux pages

The two **Aux** pages allow you to define the parameters for the auxiliary inputs.

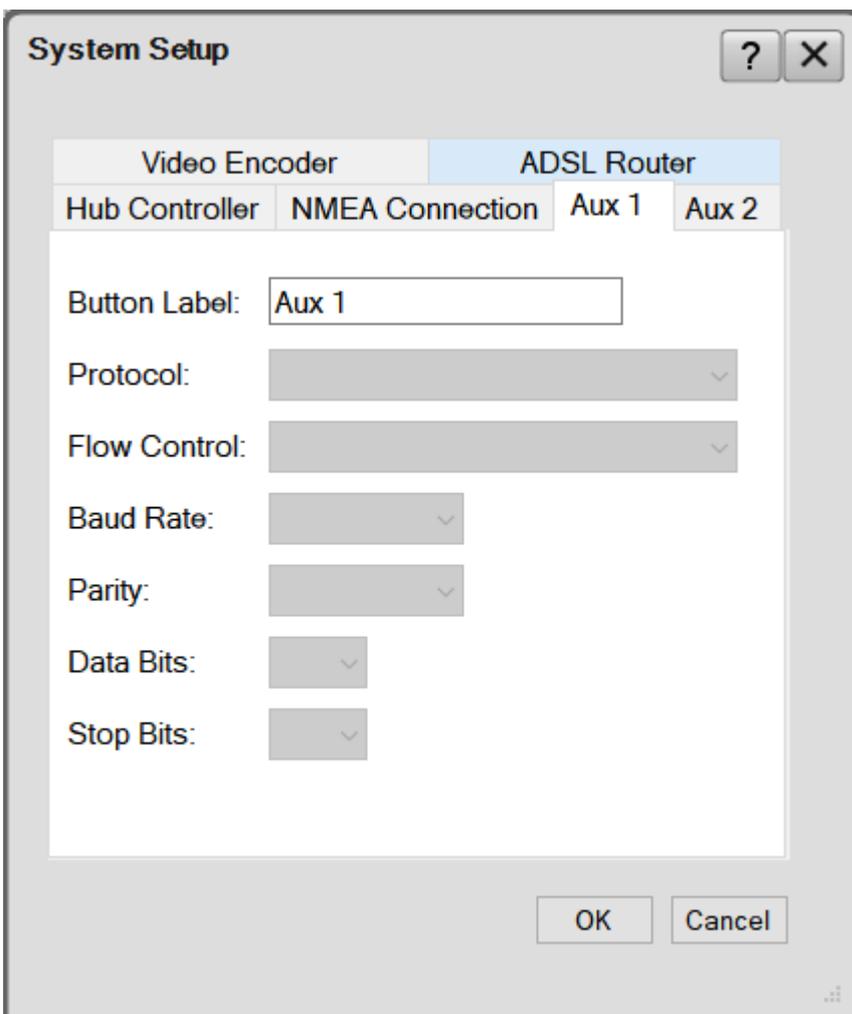
Description

Each **Aux** button on the **Operation** menu allows you to remotely enable or disable the relevant auxiliary interface connector on the Communication Hub inside the Trawl Unit. These auxiliary connectors are used to establish communication with additional equipment that may be in use, such as the DFS75 Trawl Sonar.

The interface between the DFS75 Sonar Head and the Communication Hub is made using a proprietary format. No parameter adjustments are required.

Note

The information provided by any instrument connected to the auxiliary connectors have no effect on the live video feed.



Details

Button Label

Type any name into this text field to reflect the name or type of equipment connected to the auxiliary input.

Protocol

The **Protocol** parameter specifies the telemetry interface used for the equipment, such as RS232 for serial communication.

Flow Control

This parameter is also known as “handshaking”, and it is used to ensure safe data delivery between sender and receiver. You have three options.

- *Hardware*: This setting uses the “Request To Send (RTS)” and “Clear to Send (CTS)” control signals on the serial communication, and thus requires that these pins on the RS232 serial cable are connected.
- *Software*: This setting requires that two databits, XON and XOFF, are used to indicate that data can be sent.
- *None*: The data flow functionality is not used. This is the most common setting.

Note

Data flow defined for NMEA communication is None.

Baud Rate

Use this setting to specify the baud rate ("speed") for the serial communication.

The standard baud rate defined for NMEA serial line communication is 4800 baud.

Parity

Use this function to specify the parity for serial communication.

If required, a parity bit is used in a simple error detection algorithm for a serial port. The standard parity defined for NMEA serial line communication is "None".

Data Bits

Use this function to specify the number of data bits for serial communication.

The standard number of data bits defined for NMEA serial line communication is 8 (eight).

Stop Bits

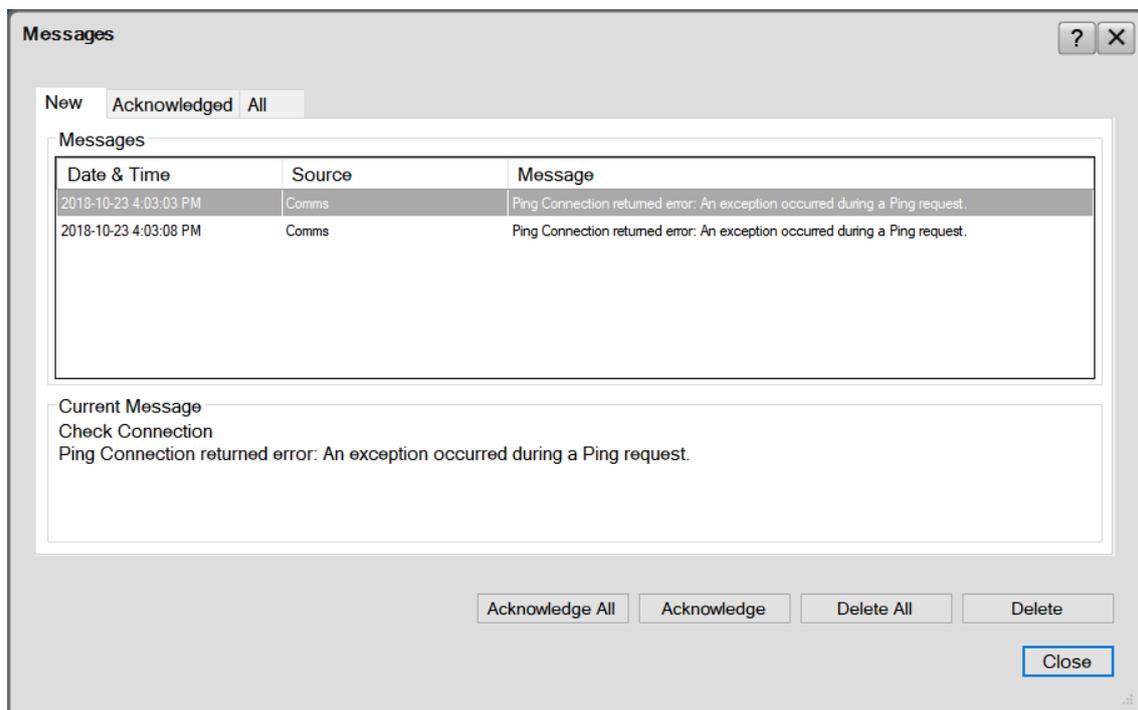
This parameter is used to indicate the end of the transmission. It is usually set to 1.

Messages dialog box

The **Messages** dialog box allows you to read and acknowledge the messages issued by the FX80.

How to open

To open the **Messages** dialog box, select **Messages** on the top bar. When a new message is issued by the FX80, the button on the top bar flashes. The colour of the triangle reflects the severity of the most serious message.



Description

Messages from the FX80 can be related to any type of hardware or software errors. Messages also communicate events related to the operational performance and conditions. The messages are divided into different types related to their importance. Warnings are indicated with a yellow colour, while errors are indicated with a red colour.

The **Messages** dialog box shows you the relevant information, the source of the information, and the time of the message. You can select a message text to copy it to the larger text box under the table. This make abbreviated messages easier to read.

Message types

Several message types are used.

- **Errors**

These errors are fatal. Operation of the FX80 cannot continue. You need to turn off the FX80 and attempt a restart.

- **System alarms**

These are messages related to the FX80 operation, or to major software components. You can continue the operation, but note that the data provided by the FX80 may be inaccurate. A restart is recommended.

- **Operational alarms**

These are messages related to environment conditions, interface or other non-software events. Depending of the message nature, check that all interfaces to the FX80 are operational. A system restart may be required.

- **Warnings**

A warning is issued when an irregular event occurs. Depending on the nature of the message, check what is causing the warning. A restart is normally not required.

- **Information**

An information messages is simply a notification of a minor operational event. No corrective actions are required.

Details

Messages

The messages are listed in a table. For each message, the date and time of issue is shown. The source of the information (for example a software function) is also provided. This information is provided for support and maintenance use.

Current Message

The text in a message may be longer than the tabular view shows you. To read the complete message, select it. The full text is then copied into the **Current Message** box.

Acknowledge / Acknowledge All

Select **Acknowledge** to accept the currently selected message, or **Acknowledge All** to accept all new messages of the current type.

Delete / Delete All

Select **Delete** to remove the currently selected message, or **Delete All** to remove all messages of the current type.

Technical specifications

Topics

[Introduction to technical specifications, page 104](#)

[Performance specifications, page 104](#)

[Weight and outline dimensions, page 105](#)

[Power requirements, page 106](#)

[Environmental requirements, page 106](#)

[Minimum third-wire infrastructure requirements, page 107](#)

[Compass safe distance, page 109](#)

[Minimum computer requirements, page 109](#)

[Minimum display requirements, page 110](#)

Introduction to technical specifications

These technical specifications summarize the main functional and operational characteristics of the FX80 Catch monitoring system. They also provide information related to power requirements, physical properties and environmental conditions.

Note

At Kongsberg Maritime, we are continuously working to improve the quality and performance of our products. The technical specifications may be changed without prior notice.

Performance specifications

These performance specifications summarize the main functional and operational characteristics of the FX80 system.

Trawl sonar

- **Operational frequency**
 - **Sonar Head:** 120, 330, or 675 kHz (*must be decided prior to purchase*)
 - **Echo sounder (optional):** 200 kHz
- **Range in DATSS SW (not detection range)**
 - **Typical:** 200 metres
 - **Maximum:** 1200 metres
- **Transmission**
 - Sequential
 - **Ping rate:** Up to 40 Hz
 - **Pulse durations:** 50 to 2400 µs

Video system

- **Camera**
 - **Type:** OE15–100A
 - **Manufacturer:** Imenco UK Limited
 - **Horizontal resolution:** 560 TV lines
 - **Light sensitivity:** 1.3×10^{-3} Lux (faceplate) (15% video)
 - **Signal to noise ratio:** Larger than 48 dB (CCIR weighted)
 - **Scanning:** 625 line / 50 Hz CCIR
 - **Video output:** 1.0V Pk — Pk composite video into 75 ohms

- **LED Lamp**

- **Type:** OE11–150
- **Manufacturer:** Imenco UK Limited
- **Total luminous output:** 2460 lumens (typical)
- **Illumination at 1 m:** 800 lux (minimum)
- **Beam:** 80 degrees (in water)
- **LED life:** More than 50,000 hours if adequately cooled

Weight and outline dimensions

These weights and outline dimension characteristics summarize the physical properties of the FX80 Catch monitoring system.

FX80 Processor Unit (Marine Computer)

- **Physical dimensions**

- **Depth:** 166 mm (6.53 in)
- **Width:** 250 mm (9.8 in)
- **Height:** 58 mm (2.3 in)

Bridge Control Unit

- **Physical dimensions**

- **Width:** 483 mm (designed for 19" rack)
- **Height:** 216 mm (4 U)
- **Depth:** 489 mm (including handles and plugs)
- **Weight:** approximately 18 kg (39.5 lb)

Camera Unit

- **Physical dimensions**

- **Width:** 360 mm
- **Height:** 250 mm
- **Depth:** 520 mm
- **Weight in air:** 21 kg (excluding cables)

Power requirements

These power characteristics summarize the supply power requirements for the FX80 system.

Processor Unit

The Processor Unit and display units require 120VAC or 230VAC and automatically detect the supply voltage.

Bridge Control Unit

- **Voltage requirement:** 115/230 VAC / 47–63 Hz / single phase, selectable (nominal)
Switch between 115 and 230 VAC manually using the voltage selector switch on the rear of the Bridge Control Unit.

Caution

You must change the input supply voltage on the Bridge Control Unit to match the ship's mains power. Failure to select the proper AC Input Voltage to match the ship's mains power may damage the Bridge Control Unit.

- **Deviation:** 15%
- **Transient:** 20% of nominal voltage, recovery time 3 s
- **Power consumption:** approximately 150 VA

Camera

- **Power input:** Constant voltage 16 to 30 Vdc

LED Lamp

- **Power input:** 18 to 30 Vdc, nominal 40 Vdc (50 W)

Environmental requirements

These specifications summarize the temperature requirements and other environmental standards for the FX80.

Reference standards

- IEC 60945

Note

To extend the lifetime of the topside equipment, we strongly recommend mounting the units at dry and clean locations with sufficient ventilation.

Processor Unit

The Processor Unit uses a high-quality commercial-off-the-shelf laptop computer workstation. This computer is intended to be installed inside in an area suitable for extended human habitation. Contact your Kongsberg Maritime representative for information about the current model that is delivered with your FX80 system.

Bridge Control Unit

- **Operational temperature:** 0 to +50°
- **Storage temperature:** -40 to +70°
- **Humidity, non-condensing:** 5 to 85%

Camera

- **Water depth:** Maximum 3000 metres
- **Operating temperature:** -5 to +40 degrees Celsius in water
- **Storage temperature:** -20 to +60 degrees Celsius
- **Vibration:** 10 g, 20 to 150 Hz
- **Shock:** 30 g peak, 25 mS half-sine pulse

LED Lamp

- **Water depth:** Maximum 4500 metres
- **Operating temperature:** -5 to +40 degrees Celsius in water
- **Storage temperature:** -20 to +60 degrees Celsius
- **Vibration:** 10 g, 20 to 150 Hz
- **Shock:** 30 g peak, 25 mS half-sine pulse

Minimum third-wire infrastructure requirements

The FX80 system provides fast update rates via ADSL digital telemetry. To sustain high update rates, the third-wire infrastructure must be capable of supporting fast data transfer.

Third wire infrastructure requirements:

- You must have a working voltage rating of 370 VDC minimum.
- The third-wire cable should pass testing for complete isolation from the coax shield to the vessel ground at 500 V.
- The loop resistance, for the entire link from topside to the Trawl Unit, must be less than 100 ohms.

- You must ensure electromagnetic compatibility of the FX80 installation with respect to cables that are part of other systems used on board.

There are three major components to the third-wire infrastructure.

Third-wire trawl cable

The third-wire trawl cable connects the Trawl Unit to the ship. The third-wire trawl cable you use should minimize power loss and signal attenuation. The 11-mm CB6000 armoured coax cable is widely used in the industry, satisfies the power and attenuation requirements, and is recommended for the FX80 system. Other cable types with similar specifications to the CB6000 may be suitable, provided they include galvanized steel wire armour. Plastic-insulated steel-core wire and 8-mm armoured wire is unsuitable.

Third-wire deck cable

The third-wire deck cable connects the topside system units. Proper deck cable construction and layout, based on best practices for minimizing electromagnetic interference, are required to attain a fast and reliable telemetry link over the third wire. We recommend using a high-quality telemetry cable, such as the RG214 coaxial cable or an impedance-controlled shielded twisted-pair cable. You may also use excess third-wire cable. The chosen cable should be similar to those of antennas with carrier frequencies up to around 1 MHz.

Important

- Do not put switches or junctions in the cable.
 - Do not use screw terminals.
 - Each connection should be crimped or soldered with all conductors intact.
 - Do not run the cable by factory equipment or with power cables.
 - Run in a conduit if at all possible.
-

Third-wire slip ring

The third-wire slip ring connects the trawl cable and deck cable at the winch. The slip ring is a critical system component for both power and telemetry. A quality slip ring provides continuous, steady contact during the winch operation. The slip ring and the associated wiring must be enclosed in a metal housing with a good electrical connection between the housing and the winch frame.

Tip

Using slip rings with waterproof connectors, such as the Focal model 180, allows for easy testing and service.

Compass safe distance

If you place any of the FX80 units on the bridge, you must observe the physical distance to the compass.

Processor Unit

Standard compass: 200 cm

Other compass: 140 cm

Bridge Control Unit

Compass safe distance: 30 cm

Minimum computer requirements

Although a computer can be ordered from Kongsberg Maritime as a part of the FX80 delivery, it is also possible to purchase one locally.

If you purchase a computer locally, make sure that the chosen model meets the functional and technical requirements.

It is important to make sure that the chosen computer model is relatively new with sufficient processing power, a high performance graphic adapter, and a high speed network adapter.

The computer must be able to facilitate the various interface requirements made by the FX80, and you may need to add extra Ethernet and serial adapters.

Note

The computer design and construction must allow for maritime use, easy access to connectors, parts and cables, and a safe installation.

The minimum technical requirements are:

- **Processor:** 1.7 GHz, Intel Core i7
- **Memory:** minimum 8 GB
- **Hard disk:** minimum 512 GB
- **Network interface:** 10/100/1000 Mbps
- **Operating system:** The FX80 software has been designed for 64-bit Windows 10. It will also work on 32-bit systems. Windows 7 is also supported.

Minimum display requirements

Unless specifically ordered, the FX80 is not provided with a display. The display must then be purchased locally.

You can use one or two displays on your FX80 Processor Unit depending on personal and/or operational preferences.

Note

Make sure that the chosen display meets the FX80 requirements. The design and construction must allow for marine use, and the display must be able to withstand the movements and vibrations normally experienced on a vessel. Verify that you have easy access to cables and connectors, and that the display can be installed in a safe and secure way.

The minimum technical requirements for the display are:

- **Resolution:**
 - **Minimum:** 1280 x 1024 pixels
 - **Recommended:** 1920 x 1200 pixels (or better)
- **Video interface:** The video interface must match the output format(s) provided by the Processor Unit.

The Processor Unit may offer video output on several formats. Investigate your options before you purchase a display.
- **Physical screen size:** The screen size depends on personal and/or operational preferences.

The FX80 software supports 16:9 displays.

Datagram formats

Topics

[About NMEA and standard datagram formats, page 112](#)

[NMEA datagram formats, page 115](#)

[Proprietary datagram formats, page 125](#)

About NMEA and standard datagram formats

Topics

[NMEA, page 112](#)

[About the NMEA datagram formats, page 112](#)

[NMEA sentence structure, page 113](#)

[Standard NMEA 0183 communication parameters, page 114](#)

NMEA

The National Marine Electronics Association (NMEA) has defined communication standards for maritime electronic equipment. The FX80 Catch monitoring system supports these standards for communication with external sensors and peripheral systems.

The most common standard is NMEA 0183. The National Marine Electronics Association describes it as follows:

The NMEA 0183 Interface Standard defines electrical signal requirements, data transmission protocol and time, and specific sentence formats for a 4800-baud serial data bus. Each bus can have only one talker but many listeners.

National Marine Electronics Association

For more information about the National Marine Electronics Association and the NMEA 0183 standard, refer to the organization's web site at:

- <http://www.nmea.org>

About the NMEA datagram formats

The FX80 can send and receive information to and from several different peripherals. All transmissions take place as **datagrams** with data sentences. Each datagram has a defined format and length.

The NMEA 0183 standard is the most common protocol used to receive and transmit data to and from peripheral sensors. A parametric sentence structure is used for all NMEA data.

The sentence starts with a “\$” delimiter and represents the majority of approved sentences defined by the standard. This sentence structure with delimited and defined data files, is the preferred method for conveying information.

For more information about the NMEA standard, the format and the data sentences, refer to NMEA’s official publications. The *NMEA 1083 - Standard for Interfacing Marine Electronic Devices* document explains the formats in detail. The document can be obtained from NMEA.

Note

The terms "Datagram" and "telegram" are generally used to describe the basic transfer unit associated with a packet-switched network. In this publication, we use the term "datagram".

NMEA sentence structure

A sentence structure is defined by NMEA to establish the communication between two units. Most other datagram formats are designed using the same, or a similar, structure.

The following provides a summary explanation of the approved parametric sentence structure:

\$aacc,c-c*hh<CR><LF>

- 1 \$
This character (Hex: 24) is used to identify the start of a sentence.
- 2 aacc
This is the address field. The first two characters (aa) identify the *talker ID*, while the last three characters are the *sentence formatter* mnemonic code identifying the data type and the string format of the successive fields.
- 3 ,
The comma (Hex: 2C) is used as a *field delimiter*. This character starts each field except the address and checksum fields. If it is followed by a null field, it is all that remains to indicate that there are no data in the field.
- 4 c-c
This is the *data sentence block*. This is a series of data fields containing all the data to be transmitted. The data field sentence is fixed and identified by the sentence formatter in the address field. Data fields may be of variable length, and they are preceded by the field delimiter.
- 5 *
This character (Hex: 2A) is the *checksum delimiter*. This delimiter follows the last field of the sentence and indicates that the following two alphanumerical characters contain the checksum.
- 6 hh
This is the *checksum*.
- 7 <CR><LF>
The carriage return and line feed characters terminate the sentence.

Note

In some proprietary telegrams received from other Kongsberg Maritime equipment, the \$ character is replaced by the @ character. The checksum field may then not be in use.

Standard NMEA 0183 communication parameters

The FX80 uses both NMEA and proprietary datagram formats to communicate with peripheral systems and sensors. The majority of the datagrams used by the FX80 are defined by the National Marine Electronics Association (NMEA). NMEA has defined a fixed set of transmission parameters.

The communication parameters defined for **NMEA 0183** are:

- **Baud Rate:** 4800 b/s
- **Data Bits:** 8
- **Parity:** None
- **Stop Bits:** 1

Some instruments may offer other parameters and/or options. You must always check the relevant documentation provided by the manufacturer.

NMEA datagram formats

Topics

[NMEA DBT datagram, page 116](#)

[NMEA DPT datagram, page 116](#)

[NMEA GGA datagram format, page 117](#)

[NMEA GGK datagram format, page 118](#)

[NMEA GLL datagram format, page 118](#)

[NMEA HDG datagram format, page 119](#)

[NMEA HDM datagram format, page 120](#)

[NMEA HDT datagram format, page 120](#)

[NMEA MTW datagram format, page 120](#)

[NMEA RMA datagram, page 121](#)

[NMEA RMC datagram format, page 122](#)

[NMEA VHW datagram format, page 123](#)

[NMEA VTG datagram format, page 123](#)

[NMEA ZDA datagram format, page 124](#)

NMEA DBT datagram

The NMEA DBT datagram provides the current depth under the transducer. In new designs, this datagram is frequently used to replace the DBK and DBS datagrams.

Format

```
$--DBT,x.x,f,y.y,M,z.z,F*hh<CR><LF>
```

Description

All depths are measured from below the transducer face.

- 1 \$—: Talker identifier
- 2 **DBT**: Datagram identifier
- 3 **x.x,f**: Depth in feet
- 4 **y.y,M**: Depth in metres
- 5 **z.z,F**: Depth in fathoms
- 6 ***hh**: Checksum

Tip

If you need the depth below the keel, use the NMEA DBK datagram. If you need the depth below the surface, use the NMEA DBS datagram.

NMEA DPT datagram

The NMEA DPT datagram provides the water depth relative to the transducer, and the offset of the measuring transducer.

Format

```
$--DPT,x.x,y.y,z.z*hh<CR><LF>
```

Description

This description is not complete. For additional details, refer to the NMEA standard.

- 1 \$—: Talker identifier
- 2 **DPT**: Datagram identifier
- 3 **x.x**: Depth (Metres), Relative to the transducer
- 4 **y.y**: Offset (Metres), Relative to the transducer

Positive offset numbers provide the distance from the transducer to the water line. Negative offset numbers provide the distance from the transducer to the part of the keel of interest.

- 5 **z.z**: Maximum range scale in use
- 6 ***hh**: Checksum

Tip _____

If you need the depth below the keel, use the NMEA DBK datagram. If you need the depth below the surface, use the NMEA DBS datagram. If you need the depth below the transducer, use the NMEA DBT datagram.

NMEA GGA datagram format

The NMEA GGA datagram transfers time-, position- and fix-related data from a global positioning system (GPS).

Format

```
$--GGA,hhmmss.ss,llll.ll,a,yyyy.yy,a,x,zz,d.d,a.a,M,g.g,M,r.r,cccc*hh
```

Description

- 1 **\$—**: Talker identifier
- 2 **GGA**: Datagram identifier
- 3 **hhmmss.ss**: Coordinated Universal Time (UTC) of the current position
- 4 **llll.ll,a**: Latitude North/South (Degrees, minutes and hundredths)
N = North
S = South
- 5 **yyyy.yy,a**: Longitude East/West (Degrees, minutes and hundredths)
E = East
W = West
- 6 **x**: Quality indicator for the GPS (Global Positioning System)
Refer to the NMEA standard for further information about the GPS quality indicator.
- 7 **zz**: Number of satellites in use (00 - 12)
The number of satellites may be different from the number in view.
- 8 **d.d**: HDOP (Horizontal dilution of precision)
- 9 **a.a,M**: Altitude related to mean sea level (geoid) (Metres)
- 10 **g.g,M**: Geoidal separation (Metres)
- 11 **r.r**: Age of GPS (Global Positioning System) data
- 12 **cccc**: Differential reference station identification (0000 - 1023)
- 13 ***hh**: Checksum

NMEA GGK datagram format

The NMEA GGK datagram is used to decode the PTNL, Time, Position, Type and DOP (Dilution of Precision) string of the NMEA 0183 output.

Format

```
$--GGK,hhmmss.ss,ddmmyy,nnnnn.nnnnnnnn,a,yyyyy.yyyyyyyy,a,x,zz,w.w,EHTteeeee,u*hh<CR><LF>
```

Description

- 1 **\$—**: Talker identifier
- 2 **GGK**: Datagram identifier
- 3 **hhmmss.ss**: Coordinated Universal Time (UTC) of the current position
- 4 **ddmmyy**: Day, month and year
- 5 **nnnnn.nnnnnnnn,a**: Latitude North/South (Degrees, minutes and hundredths)
N = North
S = South
- 6 **yyyyy.yyyyyyyy,a**: Longitude East/West (Degrees, minutes and hundredths)
E = East
W = West
- 7 **x**: Quality indicator for the GPS (Global Positioning System)
Refer to the NMEA standard for further information about the GPS quality indicator.
- 8 **zz**: Number of satellites in use (00 - 12)
The number of satellites may be different from the number in view.
- 9 **w.w**: PDOP (Position dilution of precision)
- 10 **EHTteeeee**: Ellipsoidal height of fix
- 11 **u**: Unit of height measurement
- 12 ***hh**: Checksum

NMEA GLL datagram format

The NMEA GLL datagram transfers the latitude and longitude of vessel position, the time of the position fix and the current status from a global positioning system (GPS).

Format

```
$--GLL,1111.11,a,yyyyy.yy,a,hhmmss.ss,A,a*hh<CR><LF>
```

Description

- 1 **\$—**: Talker identifier
- 2 **GLL**: Datagram identifier
- 3 **lll.ll,a**: Latitude North/South (Degrees, minutes and hundredths)
N = North
S = South
- 4 **yyyy.yy,a**: Longitude East/West (Degrees, minutes and hundredths)
E = East
W = West
- 5 **hhmmss.ss**: Coordinated Universal Time (UTC) of the current position
- 6 **A**: Status
A = The data are valid.
V = The data are not valid.
- 7 **a**: Mode indicator
- 8 ***hh**: Checksum

NMEA HDG datagram format

The NMEA HDG datagram provides heading from a magnetic sensor. If this reading is corrected for deviation, it produces the magnetic heading. If it is offset by variation, it provides the true heading.

Format

```
$--HDG,x.x,z.z,a,r.r,a*hh<CR><LF>
```

Description

- 1 **\$—**: Talker identifier
- 2 **HDG**: Datagram identifier
- 3 **x.x**: Heading (Degrees Magnetic)
- 4 **z,z,a**: Deviation (Degrees Magnetic), East/West
E = East
W = West
- 5 **r,r,a**: Variation (Degrees Magnetic), East/West
E = East
W = West

6 ***hh**: Checksum

NMEA HDM datagram format

The NMEA HDM datagram provides vessel heading in degrees magnetic. The datagram format is no longer recommended for use in new designs. It is often replaced by the NMEA HDG telegram.

Format

```
$--HDM,x.x,M*hh<CR><LF>
```

Description

- 1 **\$—**: Talker identifier
- 2 **HDM**: Datagram identifier
- 3 **x.x,M**: Heading (Degrees Magnetic)
- 4 ***hh**: Checksum

NMEA HDT datagram format

The NMEA HDT datagram provides the true vessel heading. The information is normally provided by a course gyro.

Format

```
$--HDT,x.x,T*hh<CR><LF>
```

Description

- 1 **\$—**: Talker identifier
- 2 **HDT**: Datagram identifier
- 3 **x.x,T**: Heading (Degrees True)
- 4 ***hh**: Checksum

NMEA MTW datagram format

The NMEA MTW datagram provides the current water temperature.

Format

```
$--MTW,x.x,C*hh<CR><LF>
```

Description

- 1 **\$—**: Talker identifier
- 2 **MTW**: Datagram identifier
- 3 **x.x,C**: Temperature (degrees Celcius)
- 4 ***hh**: Checksum

NMEA RMA datagram

The NMEA RMA datagram transfers the time, date, position, course and speed data from a Loran-C receiver.

Format

```
$--RMA,A,1111.11,a,yyyy.yy,a,t.1,t.2,x.x,z.z,r.r,a*hh
```

Description

- 1 **\$—**: Talker identifier
- 2 **RMA**: Datagram identifier
- 3 **A**: Status
A = The data are valid.
V = The data are not valid.
- 4 **lll.ll,a**: Latitude North/South (Degrees, minutes and hundredths)
N = North
S = South
- 5 **yyyy.yy,a**: Longitude East/West (Degrees, minutes and hundredths)
W = West
E = East
- 6 **t.1**: Time Difference A, μ S
- 7 **t.2**: Time Difference B, μ S
- 8 **x.x**: Speed over ground (knots)
- 9 **z.z**: Course over ground (Degrees True)
- 10 **r.r,a**: Magnetic variation, East/West (Degrees)
E = East
W = West
- 11 ***hh**: Checksum

NMEA RMC datagram format

The NMEA RMC datagram transfers the time, date, position, course and speed data from a global navigation satellite system (GNSS) receiver.

Format

```
$--RMC,hhmmss.ss,A,llll.ll,a,yyyy.yy,a,x.x,z.z,ddmmyy,r.r,a,*hh
```

Description

- 1 **\$—**: Talker identifier
- 2 **RMC**: Datagram identifier
- 3 **hhmmss.ss**: Coordinated Universal Time (UTC) of the current position
- 4 **A**: Status
A = The data are valid.
V = The data are not valid.
- 5 **lll.l,a**: Latitude North/South (Degrees, minutes and hundredths)
N = North
S = South
- 6 **yyyy.yy,a**: Longitude East/West (Degrees, minutes and hundredths)
W = West
E = East
- 7 **x.x**: Speed over ground (knots)
- 8 **z.z**: Course over ground (Degrees True)
- 9 **ddmmyy**: Date
- 10 **r,r,a**: Magnetic variation, East/West (Degrees)
E = East
W = West
- 11 **a**: Mode indicator
- 12 ***hh**: Checksum

NMEA VHW datagram format

The NMEA VHW datagram contains the compass heading to which the vessel points, and the speed of the vessel relative to the water.

Format

```
$--VHW,x.x,T,x.x,M,x.x,N,x.x,K*hh<CR><LF>
```

Description

- 1 **\$—**: Talker identifier
- 2 **VHW**: Datagram identifier
- 3 **x.x,T**: Heading (Degrees True)
- 4 **x.x,M**: Heading (Degrees Magnetic)
- 5 **x.x,N**: Speed relative to water (knots)
Resolution: 0.1 knots
- 6 **x.x,K**: Speed relative to water (km/hr),
Resolution: 0.1 km/hr
- 7 ***hh**: Checksum

NMEA VTG datagram format

The NMEA VTG datagram contains the actual course and speed relative to the ground.

Format

```
$--VTG,x.x,T,y.y,M,z.z,N,g.g,K,a*hh<CR><LF>
```

Description

- 1 **\$—**: Talker identifier
- 2 **VTG**: Datagram identifier
- 3 **x.x,T**: Course over ground (Degrees True)
- 4 **y.y,M**: Course over ground (Degrees Magnetic)
- 5 **z.z,N**: Speed over ground (knots)
- 6 **g.g,K**: Speed over ground (km/hr)

- 7 **a**: Mode indicator
 - A = Autonomous
 - D = Differential
 - N = Data not valid
- 8 ***hh**: Checksum

NMEA ZDA datagram format

The NMEA ZDA datagram contains the universal time code (UTC), day, month, year and local time zone.

Format

```
$--ZDA, hhmmss.ss, xx, yy, zzzz, hh, mm*hh<CR><LF>
```

Description

This description is not complete. For additional details, refer to the NMEA standard.

- 1 **\$—**: Talker identifier
- 2 **ZDA**: Datagram identifier
- 3 **hhmmss.ss**: Coordinated Universal Time (UTC) of the current position
- 4 **xx**: Day (01 - 31) (Part of UTC)
- 5 **yy**: Month (01 - 12) (Part of UTC)
- 6 **zzzz**: Year (Part of UTC)
- 7 **hh**: Local zone hours, (00 - ±13)
- 8 **mm**: Local zone minutes, (00 - 59)
- 9 ***hh**: Checksum

Proprietary datagram formats

Topics

[Simrad PSIMP-D1 datagram format, page 126](#)

[Simrad PSIMP-D datagram format, page 127](#)

[Teledyne/TSS1 datagram format, page 129](#)

Simrad PSIMP-D1 datagram format

Simrad PSIMP-D1 is a proprietary datagram format created by Kongsberg Maritime to provide the type and configuration of PS, PI and PX sensors used by a Simrad catch monitoring system.

Format

```
$PSIMP,D1,tt,dd,M,U,SNo,MNo,C,V,CR,Q,In,SL,NL,G,Cb,error*chksum<CR><LF>
```

Description

Note

This datagram format replaces the PSIMP-D format.

This datagram description is not complete. If you need further information, contact Kongsberg Maritime.

- 1 **PS**: Talker identifier
- 2 **IMP**: Datagram identifier
- 3 **D1**: Sentence specifier
- 4 **tt**: Time
- 5 **dd**: Date
- 6 **M**: Type of measurement
 - **D**: Depth
 - **T**: Temperature
 - **C**: Catch
 - **B**: Bottom
 - **N**: No sensor
 - **M**: Marker
- 7 **U**: Unit, always in SI units
 - M**: Depth measurements
 - C**: Temperature measurements
- 8 **SNo**: Sensor number
- 9 **MNo**: Measurement number
- 10 **C**: Channel
 - The number (1 to 30) of the communication channel for the current data source
- 11 **V**: Value
 - The magnitude of the current sensor measurement

- 12 **Cr**: Change rate
The magnitude of the current depth or temperature measurement
- 13 **Q**: Quality
- **0**: No connection between the sensor and the receiver
 - **1**: One or two telemetry pulses are lost, current value is predicted.
 - **2**: The current data value is reliable.
- 14 **In**: Interference
- **0**: No interference
 - **1**: Interference is detected
- 15 **SL**: Signal level
The signal level of the telemetry pulse measured in dB // 1 μ Pa.
- 16 **NL**: Noise level
The average noise level of the current channel measured in dB // 1 μ Pa.
- 17 **G**: current gain, 0, 20 or 40 dB
- 18 **Cb**: Cable quality
- **0**: Cable is not connected.
 - **1**: Cable is OK.
 - **2**: A short circuit, or the hydrophone current is too large.
- 19 **error**: Error detected
0 when no error is detected. A number greater than 0 indicates an error condition.
- 20 **checksum**: Checksum
The checksum field consists of a "*" and two hex digits representing the exclusive OR of all characters between, but not including, the "\$" and "*" characters.

Simrad PSIMP-D datagram format

Simrad PSIMP-D is a proprietary datagram format created by Kongsberg Maritime to provide the type and configuration of PS and PI sensors used by a Simrad catch monitoring system.

Format

```
$PSIMP,D,tt,dd,M,U,S,C,V,Cr,Q,In,SL,NL,G,Cb,error*checksum<CR><LF>
```

Description

Note

This datagram description is not complete. If you need further information, contact Kongsberg Maritime.

- 1 **PS**: Talker identifier
- 2 **IMP**: Datagram identifier
- 3 **D**: Sentence specifier
- 4 **tt**: Time
- 5 **dd**: Date
- 6 **M**: Type of measurement
 - **D**: Depth
 - **T**: Temperature
 - **C**: Catch
 - **B**: Bottom
 - **N**: No sensor
 - **M**: Marker
- 7 **U**: Unit
M (metres), **f** (feet) or **F** (fathoms) for depth measurements
C (Celsius) or **F** (Fahrenheit) for temperature measurements
- 8 **S**: Source
The number (1, 2 or 3) of the sensor providing the current data values.
- 9 **C**: Channel
The number (1 to 30) of the communication channel for the current data source
- 10 **V**: Value
The magnitude of the current sensor measurement
- 11 **Cr**: Change rate
The magnitude of the current depth or temperature measurement
- 12 **Q**: Quality
 - **0**: No connection between the sensor and the receiver
 - **1**: One or two telemetry pulses are lost, current value is predicted.
 - **2**: The current data value is reliable.
- 13 **In**: Interference
 - **0**: No interference

- **1**: Interference is detected
- 14 **SL**: Signal level
The signal level of the telemetry pulse measured in dB // 1 μ Pa.
- 15 **NL**: Noise level
The average noise level of the current channel measured in dB // 1 μ Pa.
- 16 **G**: current gain, 0, 20 or 40 dB
- 17 **Cb**: Cable quality
- **0**: Cable is not connected.
 - **1**: Cable is OK.
 - **2**: A short circuit, or the hydrophone current is too large.
- 18 **error**: Error detected
0 when no error is detected. A number greater than 0 indicates an error condition.
- 19 **chksum**: Checksum
The checksum field consists of a "*" and two hex digits representing the exclusive OR of all characters between, but not including, the "\$" and "*" characters.

Note

This datagram format is obsolete, and it is no longer in use on new designs. It has been replaced by datagram PSIMP-D1.

Teledyne/TSS1 datagram format

Teledyne/TSS1 is a proprietary datagram format created by Teledyne TSS Navigation Systems for heave, roll and pitch compensation. When you select this protocol, the number of sensor variables is fixed, and there is no token associated with it.

Format

```
:aabbbbb shhhhx srrrr spppp<CR><LF>
```

Description

The format is based on ASCII characters, the datagram has a fixed length, and it is terminated with a carriage return and line feed. Baud rate and output rate may be adjusted to fit your needs. The definition of the attitude angles in this format is different from the *Euler* angles definition used elsewhere. The difference appears in the roll angle, where:

$$\text{Roll}_{\text{echo sounder}} = \arcsin [\sin(\text{Roll}_{\text{Euler}}) \times \cos(\text{Pitch}_{\text{Euler}})]$$

1 **aa**: Sway acceleration

This is a dual-character hex number. The value is provided as 0.03835 m/ss units.

2 **bbbb**:Heave acceleration

This is a four-character hex number. The value is provided as 0.000625 m/ss units.

3 **s**: This is a single character.

If the value is positive, a "space" character is provided.

If the value is negative, a "-" character is provided.

4 **hhhh**: Heave position

This is a four-character decimal number. The value is given in centimetres. Positive value is "up".

5 **x**: Status

- **U**: Unaided mode/Stable data

The sensor operates without external input data.

- **u**: Unaided mode/Unstable data

The sensor operates without external input data. However, the data from the sensor is unstable. A probable cause for this is the lack of alignment after the sensor has been switched on or restarted. The alignment period from a power recycle is normally approximately five minutes.

- **G**: Speed aided mode/Stable data

The sensor operates with external input of speed data.

- **g**: Speed aided mode/Unstable data

The sensor operates with external input of speed data. However, the data from the sensor is unstable. A probable cause for this is the lack of alignment after the sensor has been switched on or restarted. It can also be a failure in the data input.

- **H**: Heading aided mode/Stable data

The sensor operates with external input of heading data.

- **h**: Heading aided mode/Unstable data

The sensor operates with external input of heading data. However, the data from the sensor is unstable. A probable cause for this is the lack of alignment after the sensor has been switched on or restarted. It can also be a failure in the data input.

- **F**: Full aided mode/Stable data

The sensor operates with external input of both speed and heading data.

- **f**: Full aided mode/Unstable data

The sensor operates with external input of both speed and heading data. However, the data from the sensor is unstable. A probable cause for this is the lack of alignment after the sensor has been switched on or restarted. It can also be a failure in the data input.

- 6 **s**: This is a single character.
If the value is positive, a "space" character is provided.
If the value is negative, a "-" character is provided.
- 7 **rrrr**: Roll angle
This is a four-character decimal number. The value is given in hundredths of a degree.
- 8 **s**: This is a single character.
If the value is positive, a "space" character is provided.
If the value is negative, a "-" character is provided.
- 9 **pppp**: Pitch angle
This is a four-character decimal number. The value is given in hundredths of a degree.

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