NavView User Guide – 05 Devices

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01	A	Initial release	SW	GAW	GAW	May 14, 2024

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5. Devices

This section provides an overview of how devices are added and configured in the NavView software.

5.1 Overview

The term *devices* refers to the peripheral hardware interfaced to NavView to provide data to NavView (e.g., GPS receivers, gyros, ROV sensor suites) and/or accept data from NavView (e.g., video overlay systems).

The data received from devices is decoded and displayed for monitoring purposes and published as observations to be used in calculations. The decoded data is also available for selection to be output by other devices.

Device configuration is saved and loaded to and from the IO.xml file in the project's Local\Station\Config folder.

If Roles and Privileges are enabled, the following are what is allowed for each role:

Roles	Privileges
Not Logged In	Cannot add, configure/edit or remove a device
User	Cannot add, configure/edit or remove a device
Online/Supervisor	Cannot add, configure/edit or remove a device
Admin (Administrator)	Can add, configure/edit or remove a device

5.2 IO Devices Window

The Devices window is accessed by clicking the Devices button in the Configuration section of the Setup ribbon or from the project Explorer view. Control and monitoring of devices is done using the IO Devices window.

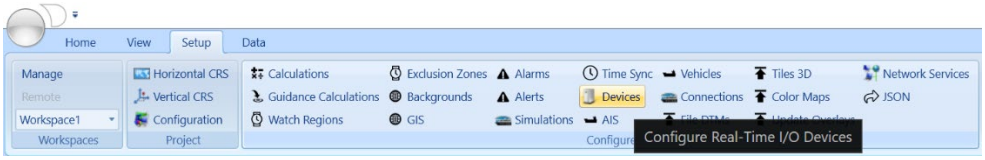

FIGURE 5-1 DEVICES - SETUP RIBBON

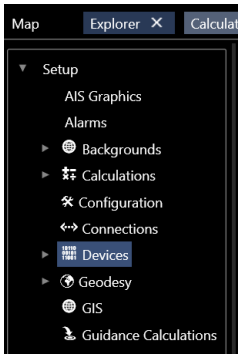

FIGURE 5-2 DEVICES - EXPLORER

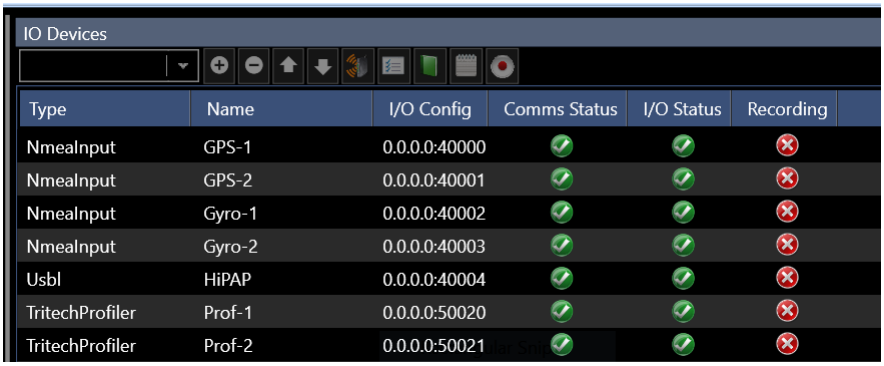

FIGURE 5-3 IO DEVICES WINDOW

Alternatively, the IO Devices view can be accessed from the Explorer view by selecting Devices under the Setup branch.

The tool bar provides access to the configuration and monitoring features for devices. The data grid provides an overview of the devices present and their status, indicates status is OK or enabled, indicates the status is bad or disabled. The following details the data grid columns.

- Type
  - Device type, i.e., the NavView name of the device added as given in the respective device list
- Name
  - Name assigned to the device by the operator
- I/O Config
  - Interface parameters
- Comms Status
  - Status of the communication protocol, status is considered OK as follow:
    - Serial Port: Valid existing port selected
    - TCP/IP Client: Connected to remote host
    - TCP/IP Server: Socket is bound to specified local port
    - TCP/UDP: Socket exists
    - File: Write to file is enabled

- I/O Status
  - Status of the message reception/transmission, status is considered OK as follow:
    - In the case of an input device, if the expected message(s) are being successfully received and decoded
    - In the case of an output device, if it has been configured and is outputting data
- Recording
  - State of raw data recording

Control and monitoring of devices is accessed via the IO Devices window.

5.3 Add a Device

Note: If Roles are enabled, only users with Administrator privileges can add a device.

1. Access the IO Devices window from the Configuration section of the Setup ribbon or from the project Explorer view.
2. Click the drop-down list box in the tool bar to open the list of supported devices.

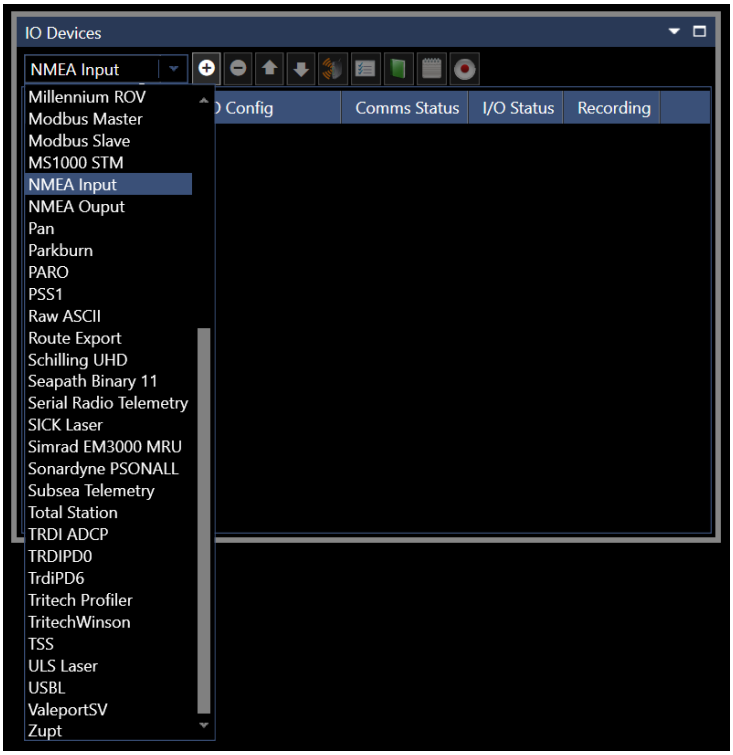

FIGURE 5-4 SUPPORTED DEVICE LIST

3. Select the device to add.
4. Click the  button, the Configure Device I/O dialog will open. See Figure 5-5

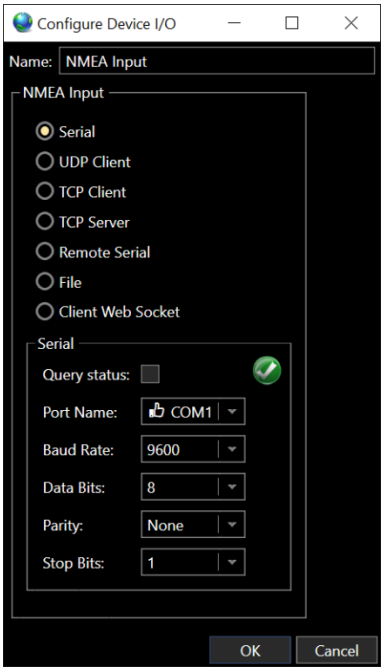

FIGURE 5-5 CONFIGURE DEVICE I/O

5. Configure the device communications (see Configure Device Communication Parameters)
6. On clicking OK in the Configure Device I/O dialog, the device will be added to the bottom of the device list in the data grid.

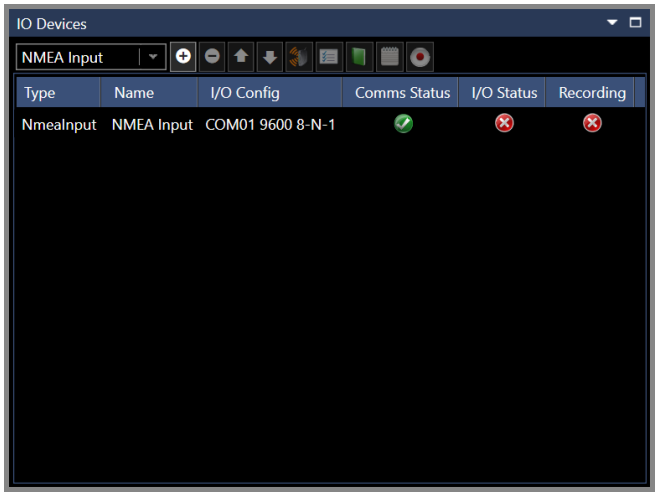

FIGURE 5-6 DEVICE ADDED

The supported devices are:

- BlueView ProViewer
- CDL Gyro
- Configurable Input (operator configurable input messages and fields)
- Configurable Output (operator configurable output messages and fields)
- Forssea V-LOC
- Fusion2 Client

- GNSS
- HYDRINS
- IMCA Telemetry
- Inertial Labs MRU
- Innovator ROV
- IXBLUE INS
- IXSEA Octans
- Lemkuhl LR40
- Lodestar Input (Sonardyne Lodestar interface)
- Lodestar INS
- Marksman/Ranger2
- Millennium ROV
- Modbus Master
- Modbus Slave
- MS1000 STM
- NMEA Input (standard and proprietary NMEA messages)
- NMEA Output (standard NMEA messages)
- Pan (Sonardyne PAN control interface)
- Parkburn
- PARO (Paroscientific Digiquartz Depth Sensor)
- PSS1
- Raw ASCII
- Route Export
- Schilling UHD (standard UHD ROV message)
- Seapath Binary 11
- Serial Radio Telemetry
- SICK Laser
- Simrad EM3000 MRU
- Sonardyne PSONALL (Fusion PSONALL message)
- Subsea Telemetry
- Total Station
- TRDI ADCP
- TRDIPD0
- TRDIPD6
- Tritech Profiler
- Tritech Winson
- TSS (Teledyne TSS1 and TSS3 messages)
- ULS Laser
- USBL
- ValeportSV
- Zupt

5.4 Remove a Device

Note: If Roles are enabled, only users with Administrator privileges can remove a device.

1. Access the IO Devices window from the Configuration section of the Setup ribbon or from the project Explorer view.
2. Select the device to remove in the data grid.
3. Click the  button.
4. When prompted to confirm that the device is to be removed, click Yes or No accordingly.

5.5 Move Devices

Note: If Roles are enabled, only users with Supervisor or Administrator privileges can move a device.

1. Access the IO Devices window from the Configuration section of the Setup ribbon or from the project Explorer view.
2. Select the device to move in the list.
3. Click the  button to move the device up the list one spot.
4. Click the  button to move the device down the list one spot.

Note: The order of the devices in the list does not affect the operation or performance of the devices.

5.6 Configure Device Communication Parameters

Note: If Roles are enabled, only users with Administrator privileges can configure a device's communication parameters.

1. Access the IO Devices window from the Configuration section of the Setup ribbon or from the project Explorer view.
   a. Select device to configure in the data grid
   b. Click the  button to open the Configure Device Communications dialog (see Figure 5-5); or
   c. Right mouse click on the device and click on Configure Comms; or
2. From the respective Device Status window, click the  button.

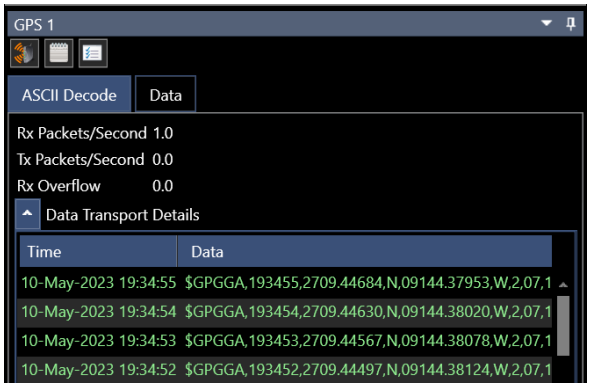

FIGURE 5-7 DEVICE STATUS – IO

3. Enter the Name to display for this device as, it is recommended that the name used is representative and descriptive of the device, e.g., GPS 1.

4. Select the desired communication protocol, the respective configuration options will present in the lower group box, configure accordingly (these are detailed in the following sections).

5. Click Apply to apply the changes and leave the dialog open; or

6. Click OK to apply the changes and close the dialog; or

7. Click Cancel to abort the changes and close the dialog.

Note: Clicking the Cancel button after applying the changes (clicking Apply) does not revert to the pre-applied settings, it just closes the dialog.

5.6.1 Serial

The use of the term serial refers to the use of a Windows recognized serial port for the input and output of data. These may be physical ports on the computer or virtual ports on an Ethernet serial server, as long as Windows recognizes them as ports.

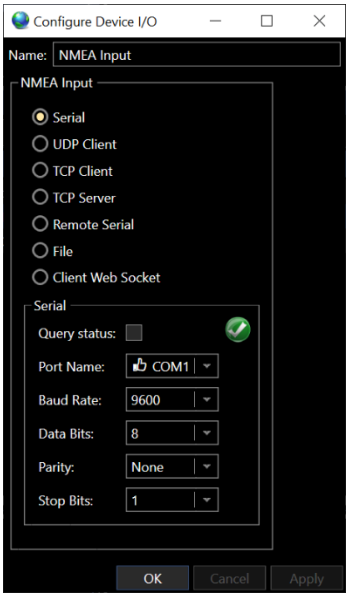

FIGURE 5-8 I/O - SERIAL CONFIGURATION

When a device is added, it defaults to the Serial protocol. If it has been changed and it is to be changed back, this is done by selecting the **Serial** radio button. The serial port parameters can then be configured.

- **Query status**
  - Check this box to instruct NavView to query all available serial ports to determine their availability.
  - The status of the selected port is indicated by either a green check mark or a red X
  - If the selected port exists and was successfully accessed by NavView, this is indicated by a green check mark
  - If the selected port either does not exist or it does but NavView was unable to access it perhaps due to it currently being in use by another application, this is indicated by a red X

Note: The status is generally only indicated with a red X if a project file is loaded and a serial port that was previously successfully assigned and used is now not present or is in use by another application.

Note: **Do not use when RealComm mode is being used.** To query a port's availability, NavView attempts to open it. This can cause a port to be reset on some Ethernet serial servers depending upon their configuration (e.g., RealComm mode) resulting in a communications failure of other applications connected to the port. To eliminate this possibility, the user has the option to *Query status* of the ports or not to determine their availability. The default is off. The setting persists until NavView is exited whereupon relaunching it resets to unchecked.

- **Port Name**
  - This drop-down list box contains all ports that NavView has determined to be present.
  - Click to display the list and select the desired port.
    - If the Query status is not checked and the port has not previously been selected for this device, a is displayed next to the port name.
    - If the port is available, a is displayed next to the port name.
    - If the port is in use by another NavView device or another application, a is displayed next to the port name.

- **Baud Rate**
  - This drop-down list box contains supported baud rates.
  - Click to display the list and select the desired baud rate setting.

- **Data Bits**
  - This drop-down list box contains data bit options.
  - Click to display the list and select the desired data bit setting.

- **Parity**
  - This drop-down list box contains parity options.

- Click to display the list and select the desired parity setting.

- **Stop Bits**
  - This drop-down list box contains stop bit options.
  - Click to display the list and select the desired stop bit setting.

5.6.2 UDP Client

NavView supports interfacing using UDP Client protocol.

Select **UDP Client** by clicking the respective radio button. The parameters can then be set.

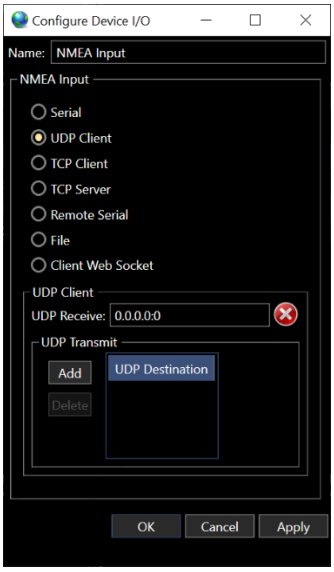

FIGURE 5-9 I/O - UDP CLIENT CONFIGURATION

- **UDP Receive**
  - Enter the Port to listen to for incoming data, i.e. 0.0.0.0:5000

Note: The IP address is to be 0.0.0.0.

- **Status**
  - The status of the entered port is indicated by either a green check mark or a red X
  - If the entered port exists and was successfully accessed by NavView, this is indicated by a green check mark
  - If the entered port either does not exist or it does but NavView was unable to access it, this is indicated by a red X

- **UDP Transmit**
  - Add
    - To transmit data as an output port, a destination must be configured
    - The default is 255.255.255.255:50000
    - To add a destination, click the Add button and edit the IP address and Port number accordingly
    - To configure a destination that is already present, click in the respective box and make the desired changes
  - Delete
    - To delete a destination, select it in the list
    - Click the Delete button

5.6.3 TCP Client

NavView supports interfacing using TCP/IP client protocol.

Select **TCP Client** by clicking the respective radio button. The parameters can then be set.

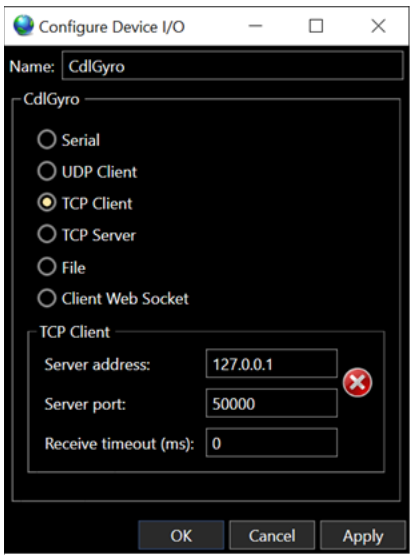

FIGURE 5-10 I/O - TCP CLIENT CONFIGURATION

- **Server Address**
  - Enter the TCP server address, default is 127.0.0.1
- **Server Port**
  - Enter the server port to use, default is 50000
- **Status**
  - The status of the entered IP address and/or port is indicated by either a green check mark or a red X

- If the entered address and/or port exists and was successfully accessed by NavView, this is indicated by a green check mark
- If the entered address and/or port either does not exist or it does but NavView is unable to access it, this is indicated by a red X

- **Receive timeout (ms)**
  - Enter the timeout period (ms) the TCP client will wait before disconnecting and starting the reconnect attempt sequence.

5.6.4 TCP Server

NavView supports interfacing using TCP/IP server protocol.

Select **TCP Server** by clicking the respective radio button. The parameters can then be set.

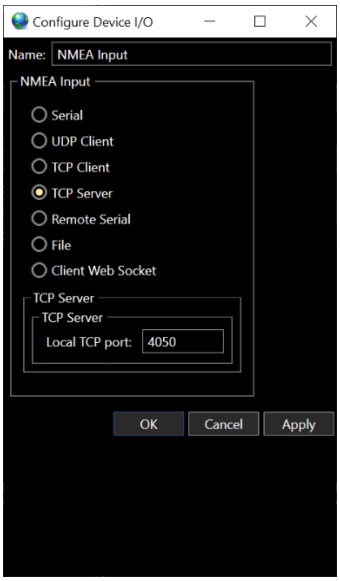

FIGURE 5-11 I/O - TCP SERVER CONFIGURATION

- **Local TCP Port**
  - Enter the Local Port number (Server) to be used by a client to listen to for a connection.

5.6.5 Remote Serial

This is being discontinued.

5.6.6 File

NavView has the option to add an IO device to output data to a text file.

Select **File** by clicking the respective radio button and configure as required. The file created uses a **.txt** ending.

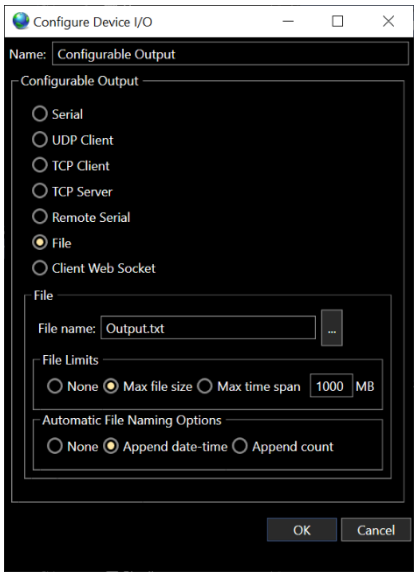

FIGURE 5-12 I/O - FILE CONFIGURATION

- **File name**
  - Enter base target file name; or
  - Click on ... to browse to target folder and enter base file name.

Note: If an invalid, empty or inaccessible file path and name is present, NavView will report that it is **Unable to create FileStream** in the log file every time new data is to be written out. This can result in large log files with a lot of repeat messages making use of the log file for troubleshooting other issues difficult. Ensure the configuration is valid.

- **File Limits Options**
  - Controls the creation of new files.
  - Select **None** to disable new file creation based on file size or elapsed time
  - Select **Max file size** to control the creation of new files based on file size
    - Enter the maximum file size in megabytes
    - If the adding of the next record to the current file will result in the file size exceeding the maximum file size specified, a new file is created, and data is written to it
  - Select **Max time span** to control the creation of new files based on elapsed time
    - Enter the time span for the file in hh:mm:ss.f
    - When a file is created the start time is set as is the end time based on the time span.

  - When a record is to be written to file, if the time is past the calculated end time, a new file is created, and the data is written to it

- **Automatic New File Naming Options**
  - Controls the naming of files.
  - Select **None** if the same file is to be used to write all data to, the base file name is used.
  - If a **File Limits** option is enabled and it triggers a new file, the file is overwritten.
  - Applicable when a log of the data is only required in case of an incident, i.e., if after 12 hours nothing has occurred to require the position history of all vehicles, roll the file over and start a new 12 hour window of data logged
  - Select **Append date-time** to create unique file names based on date and time of file creation. Time is UTC
  - If a **File Limits** option is enabled and it triggers a new file, the date and time the new file created is appended to the base file name (base_file_name-[ddmmmyyy-hhmmss].txt)
  - Select **Append count** to create unique file names based on an incrementing count.
  - Enter a **Count** value to be used as the next count

Note: The count value displayed is the current next count value to use.

  - If a File Limits option is enabled and it triggers a new file, the count is incremented and appended to the base file name (base_file_name-[count].txt)
    - Before using the new file NavView checks to ensure that an existing file with the new file name in the respective folder does not already exist, if it does the count is incremented and the check repeated until a unique file name is determined

5.6.6.1 Enable/Disable Writing to File

- The enabling and disabling of writing to file is controlled from the Devices Window tool bar

- When a I/O device that has been configured for File is selected in the data grid, either a  button or  button is displayed in the tool bar.
  - Click the  button to start writing to file, the button changes to 
  - Click the  button to stop the writing to file, the button changes to 

Note: If a target file has not been assigned, clicking the  will not start the write to file and the button will not change.

5.6.7 Client Web Socket

NavView supports interfacing using Client Web Socket protocol.

Select **Client Web Socket** by clicking the respective radio button. The parameters can then be set.

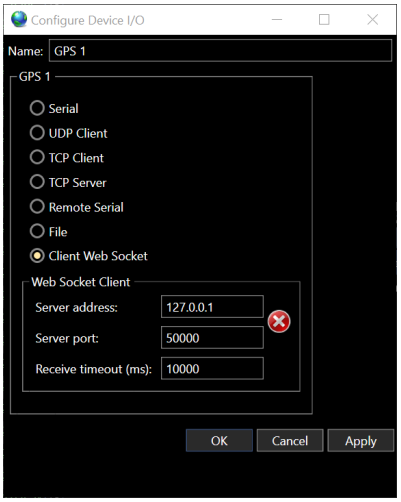

FIGURE 5-13 I/O – CLIENT WEB SOCKET

- **Server Address**
  - Enter the TCP server address, default is 127.0.0.1
- **Server Port**
  - Enter the server port to use, default is 50000
- **Status**
  - The status of the entered IP address and/or port is indicated by either a green check mark or a red X
  - If the entered address and/or port exists and was successfully accessed by NavView, this is indicated by a green check mark
  - If the entered address and/or port either does not exist or it does but NavView is unable to access it, this is indicated by a red X
- **Receive timeout (ms)**
  - Enter the timeout period (ms) the Web Socket Client will wait before disconnecting and starting the reconnect attempt sequence

5.7 Configure Device Application

Note: If Roles are enabled, only users with Administrator privileges can configure a device's settings.

1. Access the IO Devices window from the Configuration section of the Setup ribbon or from the project Explorer view.
   a. Select device to configure in the data grid
   b. Click the  button to open the respective configuration dialog; or
   c. Right mouse click on the device and select Device Settings; or
2. From the respective Device Status window, click the  button.

Note: Each device has a specific configuration. Details for each device are given in Device Documentation.

5.8 Monitoring a Device

There are 2 primary views for monitoring device operation.

5.8.1 Device Status Window

1. Access the IO Devices window from the Configuration section of the Setup ribbon or from the project Explorer view.
   a. Select device to configure in the data grid
   b. Click the  button to open the Device Status window; or
   c. Right mouse click on device and select Device Window; or
   d. Select the device in the Explorer view

The Device Status window enables the monitoring of the messages, both incoming and outgoing, and in the case of incoming, the decoded information and the observations published.

The port configuration, device configuration and display of the terminal window can be accessed directly from the Device Status window via the buttons at the top left of the window.

For most devices, the Device Status window has two tabs, ASCII Decode and Data. Those devices that vary from this are detailed in the respective device documentation.

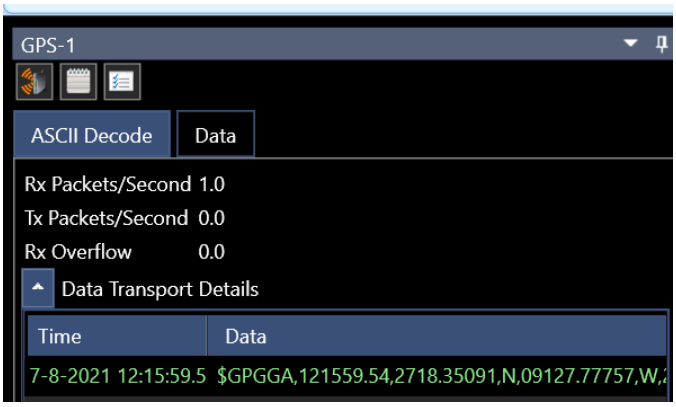

FIGURE 5-14 DEVICE STATUS WINDOW

5.8.1.1 ASCII/Binary Decode Tab

- The ASCII/Binary Decode tab provides information on the packets received and transmitted per second and a receive buffer overflow status
- In the Data Transport Details bottom portion of the tab, the messages, both transmitted and received, are displayed along with their system time stamp in either ASCII text or binary hexadecimal depending on data type. This is a scrolling display with the newest message at the top

Note: Outgoing data is displayed in blue, incoming data is displayed in green.

Note: This view is CPU intensive and therefore should be used for troubleshooting only.

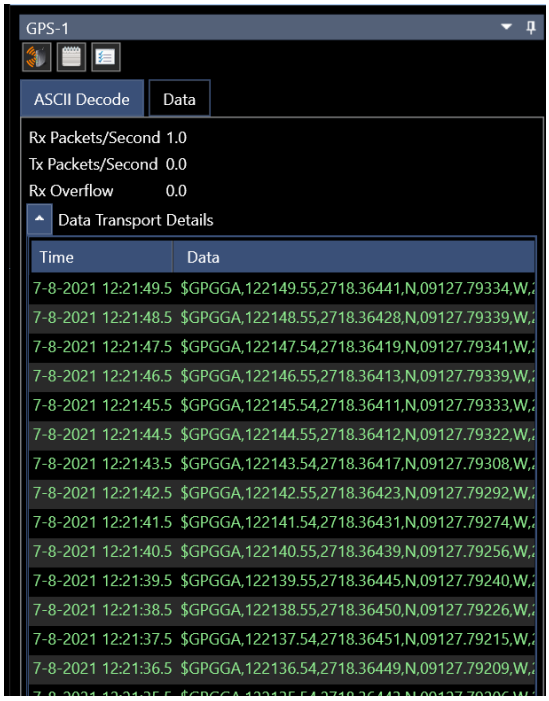

FIGURE 5-15 DEVICE STATUS WINDOW - ASCII DATA TAB

5.8.1.2 Data Tab

- The Data Tab provides a display of the messages detected, the decoded data and the observations created from the data. Figure 5-16 shows the Device Status window, Data Tab for an NMEA Input device.
  - The left panel displays the messages received, e.g., GGA
  - Selecting the message displays the decoded data in the right panel
  - Expanding the messages displays the observations generated by the device
  - Selecting an observation displays the published observation data in the right panel

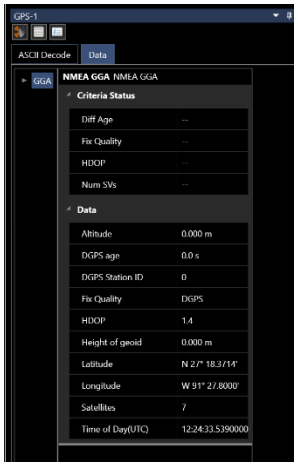

FIGURE 5-16 DEVICE STATUS WINDOW - DATA TAB

5.8.2 Device Terminal Window

The Device Terminal window provides the means to monitor exactly what is being received on the port. This window displays all bytes received at the port in hexadecimal and ASCII. This then provides a good trouble shooting tool when determining what is being received by NavView.

1. Access the IO Devices window from the Configuration section of the Setup ribbon or from the project Explorer view.
   a. Select device to configure in the data grid
   b. Click the  button to open the Show Comms window; or
   c. Right mouse click on the device and select Show Comms; or
2. From the respective Device Status window, click the  button.

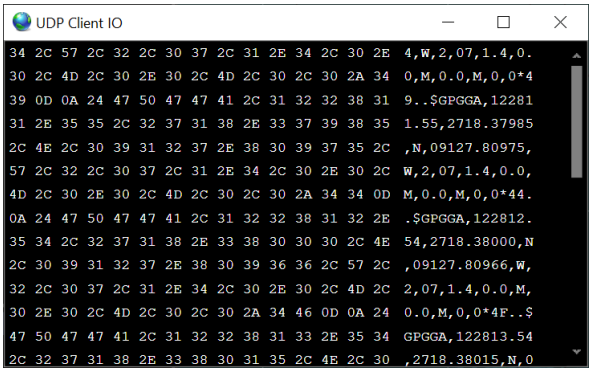

FIGURE 5-17 DEVICE TERMINAL WINDOW

Note: The Terminal window does not update on every byte received, rather it updates once per second writing all bytes received since the last update to the window.

5.9 Raw Data Logging

NavView supports the logging of data received by a device in its native format with its Globally Unique Identifier (GUID) and associated system timestamp for each message logged.

The folder and file structure is as follows:

- Project
  - Local
    - Station
      - Data
        - RawData
          - Device
            - Date

Time.txt

Where time is **hhmmss** for the time the file was created.

1. Select device in the data grid to log raw data.
   a. Click the  button to toggle between enable and disable raw data logging for that device; or
   b. Right mouse click on the device and select Toggle Recording
   c. This can be repeated to log more than one device
2. When enabled, a  will display in the Recording column of the data grid for the respective device.
3. When disabled, a  will display in the Recording column of the data grid for the respective device.