

<b>WinFrog Device Group:</b>	<b>Output</b>
<b>Device Name/Model:</b>	<b>Cegelec 802 DP</b>
<b>Device Manufacturer:</b>	<p><b>Cegelec Industrial Controls Ltd.</b> West Avenue, Kidsgrove, Stoke-On-Trent, Staffordshire, ST7 1TW, England. Phone: 01782 783511</p> <p><b>Cegelec ESCA Corporation</b> 11120 NE 33rd Pl. Bellevue, WA 98004 Tel: (425) 822-6800; Fax: (425) 889-1702</p>
<b>Device Data String(s) Output to WinFrog:</b>	\$PKDRW (request for a waypoint), \$PKWPC (end of waypoint reached telegram)
<b>WinFrog Data String(s) Output to Device:</b>	Position: Cegelec Position Format Waypoint/Line: \$PKNCW (clear buffer cmd), \$PKNNW,
<b>WinFrog .raw Data Record Type(s):</b>	Type: 450

#### **DEVICE DESCRIPTION:**

Cegelec is the electrical contracting branch of the multinational Alcatel Alsthom Group. WinFrog is presently capable of interfacing to two Cegelec Dynamic Positioning Systems, the 802 and the 901. The Cegelec Dynamic Positioning Systems can be found on numerous vessels where they control vessels propulsion systems via inputs from positioning systems, gyrocompasses, wind speed and direction monitoring equipment, and any other sensors which can assist with the automatic positioning of the vessel.

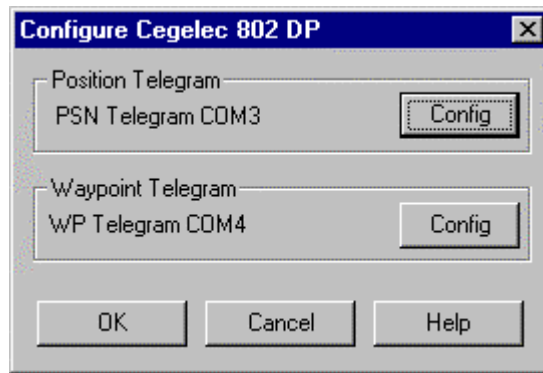
#### **DEVICE CONFIGURATION INSTRUCTIONS (WinFrog Suggested):**

Baud Rate: 9600  
Data Bits: 8  
Stop Bits: 1  
Parity: None

The above communication parameters are the standards used for configuring both the Position Telegram (Port) and the Waypoint Telegram (Port) as shown in the Cegelec 802 DP (Edit I/O) configuration dialog box.

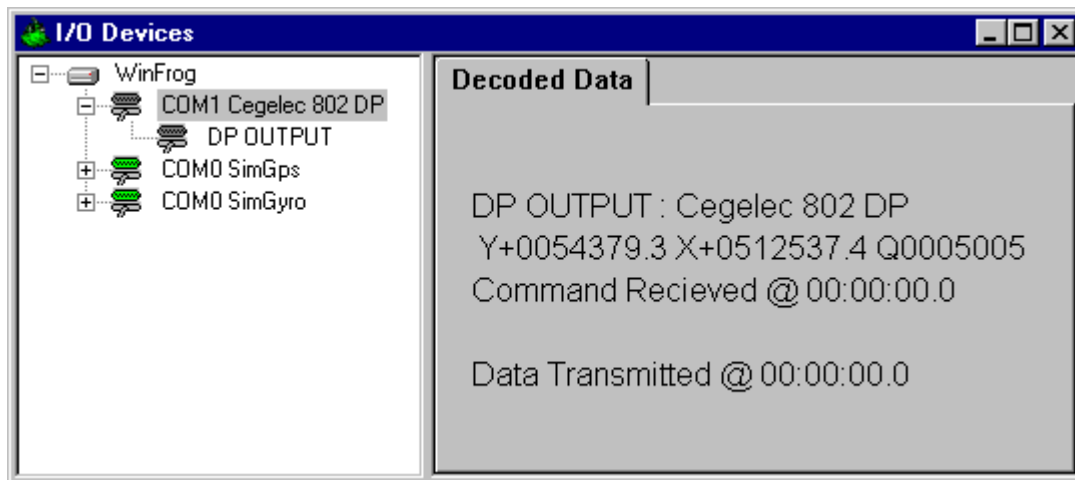
#### **WINFROG I/O DEVICES > CONFIG OPTIONS:**

The Cegelec 802 DP is added to WinFrog from the OUTPUT device types. The DP OUTPUT data type is added along with the Cegelec 802 DP device. When the device is added to WinFrog, the following (Edit I/O) dialog box appears for configuring output data. This dialog box is also accessible after the device is added, via the Configure > I/O Devices > Edit I/O command or highlight the Cegelec 802 device in the I/O window, right-click and choose Edit I/O.

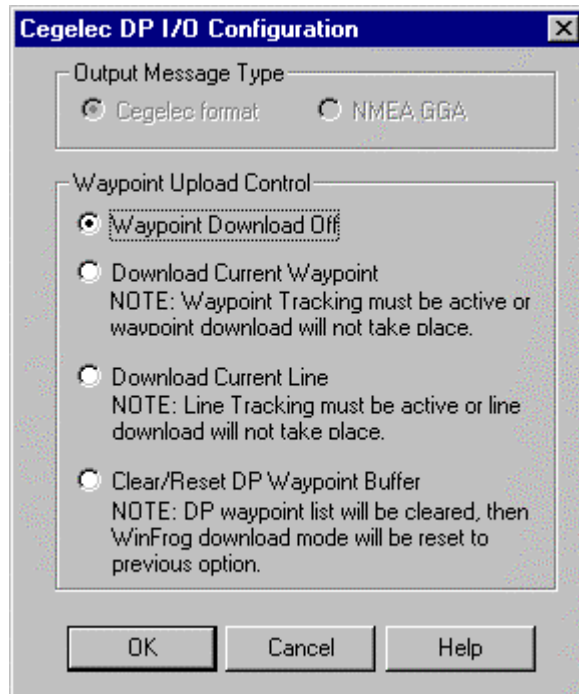


The first item is designating the input/output ports for the interface. In the example above, the output (position) to the Cegelec 802 is via COM 3, while the input/output (Waypoint/Line data) is via COM4. Since the DP system requests, and then receives the Waypoint/Line data from WinFrog, this port operates at full duplex. The Surveyor and DP Operator must ensure that the communication parameters are identical for both the DP System, and this WinFrog COM port.

Once the COM ports are chosen, the Cegelec 802 DP device will appear in the I/O Devices Window. For this example, simulated devices have been added to the system and appear in the I/O Device Window only for display of the Cegelec Format position string output (under Decoded Data).



Waypoint and Line data transfer between WinFrog and the Cegelec DP System is configurable via the Cegelec DP I/O Configuration dialog box shown below. This dialog box is accessible after the Cegelec 802 DP device is added, via the Configure > I/O Devices > Configuration command or highlight the Cegelec 802 device in the I/O window, right-click and choose Configure Device.



The Output Message Type is not available because only the Cegelec Format position output is available for the Cegelec 802 DP. Note that the Cegelec 901 is also capable of the GGA position output.

The Waypoint/Line communication will be discussed in this section; however, in order for any data to be sent, or received from the DP System, the following must be in place:

- A Position Sensor must be added to the Vehicle,
- The Vehicle must be tracking a Line or Waypoint.

Adding sensors and items to the Vehicle is covered in the section WINFROG VEHICLE TEXT WINDOW > CONFIGURE VEHICLE DEVICES > DEVICE > EDIT OPTIONS. The operation of the Waypoint Upload Control in the Cegelec DP I/O Configuration dialog box is discussed below.

#### **Waypoint (or Line) Upload Control:**

To transfer waypoint or line data to the Cegelec DP System, a WinFrog Vehicle must have the **OUTPUT, Cegelec 802 DP, DP OUTPUT** added, as well as a waypoint or line selected and being tracked (depending upon the option below). The Cegelec DP System initiates the download from the Cegelec 802 DP Console. Once WinFrog is configured, the DP Operator (not the Surveyor) can download Waypoint or Line Node data when desired.

The four download options the Surveyor can configure and provide to the DP Operator are as follows:

**Waypoint Download Off** - WinFrog disables the waypoint download. When set to this, a download initiated from the DP System will result in no action.

**Download Current Waypoint** - WinFrog will send the current active Waypoints. In this mode, the DP System requests waypoints, and WinFrog provides the required From and To Waypoints. Note that Waypoint Tracking must be active or waypoint download will not take place.

**Download Current Line** - WinFrog determines the current line segment being tracked; and, starting with the node that defines the start point of this current segment, sends all the nodes in the line from this node to the last node. In this mode, when the DP System requests waypoints, the first point sent by WinFrog will be designated as Waypoint #1, regardless of the actual line segment involved. The correct WinFrog Line Segment designation is sent as the Waypoint Name. Note that Line Tracking must be active or 'waypoint' download will not take place.

**Clear/Reset DP Waypoint Buffer** - Setting this option will result in the DP System waypoint buffer being cleared (by WinFrog). This is valuable in that it clears the waypoint buffer prior to future downloading operations. The Surveyor should clear the Buffer, then select one of the above download options, prior to the future waypoint or line data requests from the DP System.

Anytime the mode is changed, WinFrog will clear the DP System waypoint buffer, at the next request from the DP System, prior to sending new data. This is regardless of the Clear/Reset mode setting.

WinFrog should be set to the desired option and then left. In this way, the DP System can request and receive waypoint data, as it is required.

#### **WINFROG VEHICLE TEXT WINDOW > CONFIGURE VEHICLE DEVICES > DEVICE > EDIT OPTIONS:**

The **OUTPUT, CEGELEC 802 DP, DP OUTPUT** data item is added to the Dynamically Positioned Vehicle. The DP data type and a positioning data type must be added in order to send positioning data to the Cegelec 802 DP System.

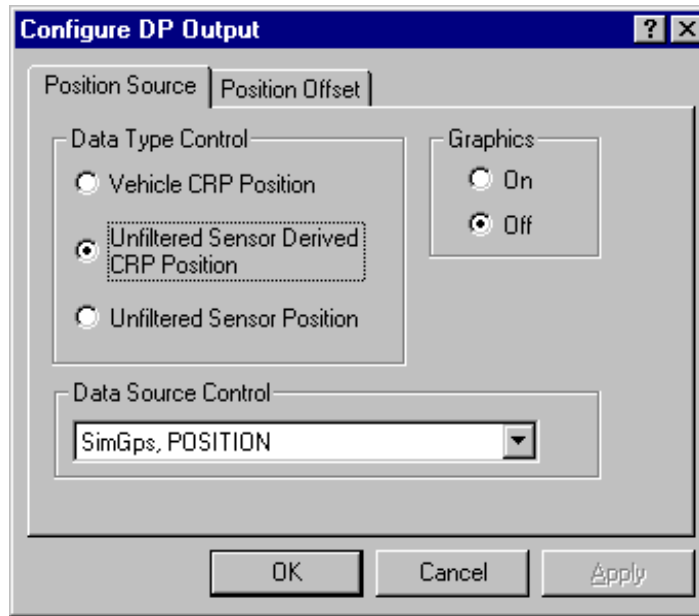
If the Cegelec 802 DP Configuration is set to Download Current Waypoint (in the Cegelec DP I/O Configuration dialog box), then the vehicle must be tracking a Waypoint. Similarly, if the Cegelec 802 DP Configuration is set to Download Current Line, then the vehicle must be tracking a Survey Line. No warning window appears if any of the above is not executed; however, new data will not be visible in the I/O Devices Window under Decoded Data, as is shown previously in the Cegelec DP I/O Configuration dialog box.

When the **CEGELEC 802 DP, DP OUTPUT** data item is edited from the Configure Vehicle - Devices dialog box, the **Configure DP Output** dialog box appears as shown below. The **Position Source** and the **Position Offset** tabs must be configured here. These items

configure the vehicle position source and any offsets applied. Refer to the type 450 record under Configuration Details for the raw data record.

### Position Source:

Three items need to be configured in this tab: Data Type Control, Graphics, and Data Source Control.



### Data Type Control:

In Data Type Control, there are three options to choose from: Vehicle CRP Position, Unfiltered Sensor Derived CRP Position, and Unfiltered Sensor Position.

Choose the **Vehicle CRP Position** for filtered position updates (Kalman, velocity etc as applied to the vehicle) referenced to the vehicles' Central Reference Point (CRP). The offset input under the Position Offset tab is added to the CRP position.

The **Unfiltered Sensor Derived CRP Position** is the same as the above only unfiltered data is output. With this option, filtering can be performed within the DP unit. This is often the preferred option as most DP units have more rigorous filtering routines that require an unfiltered data input.

The **Unfiltered Sensor Position** outputs unfiltered positions from the positioning sensors' location. The offset input under the Position Offset tab is added to the sensors raw position.

### Data Source Control:

The data source depends on the Data Type Control that was selected. If the Vehicle CRP Position is chosen, the Data Source Control will automatically be set to VEHICLE, CRP POSITION, and the primary positioning sensor data will be used. If

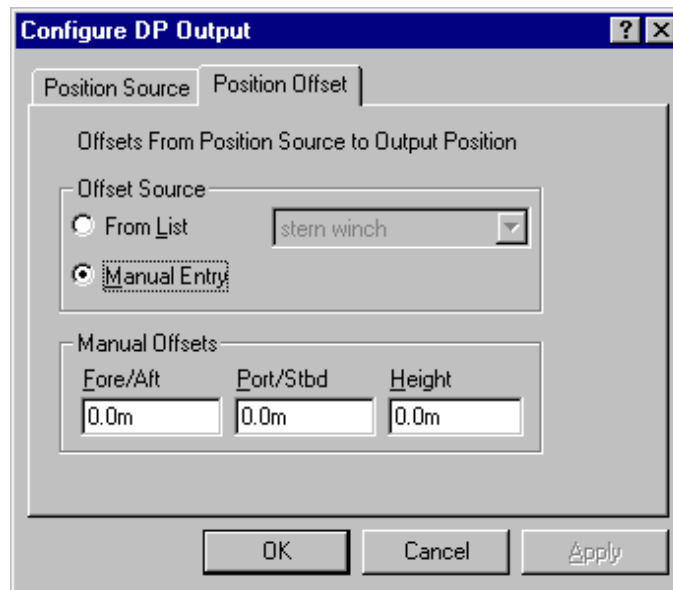
either the Unfiltered Sensor Derived CRP Position or the Unfiltered Sensor Position is chosen in the Data Type Control, then the positioning sensor can be chosen from the dropdown list box under Data Source Control. Here a secondary positioning sensor can be chosen. It is important to note that the Unfiltered Sensor Derived CRP Position is based on the chosen sensor, however the data is related to the CRP. Note that the SimGps, POSITION is used in this window as an example only.

**Graphics:**

If the graphics on radio button is selected a small square with the label Cegelec 802 DP will appear at the output coordinates on the graphics screen.

**Position Offset:**

As shown in the dialog box below, the 'Offsets From Position Source to Output Position' can also be configured here. This means that any offset input here will be applied to the position output from the Position Source tab options listed above.



**Offset Source:**

The Offset Source can be chosen from the list of offsets for the vehicle, or the Manual Entry can be used.

**Manual Offsets:**

If Manual Entry is chosen under the Offset Source, the offsets must be input here. Offsets are input similar to all offsets in WinFrog.

## CONFIGURATION DETAILS:

The Cegelec 802 system is installed on vessels including the Dock Express 20. In most cases a Configuration Document will be present onboard and should be referenced when setting up, or checking the WinFrog system installation.

### Cegelec 802 Output Strings:

The Cegelec 802 DP Outputs Request for Waypoint, and End of Waypoint Reached data strings.

#### **\$PKDRW – Request for Waypoint**

\$PKDRW

When:

\$PKDRW is sent to WinFrog, the string "%c",0xEA" is returned to the Cegelec in order to keep coms open.

### WinFrog Waypoint Output Strings:

WinFrog outputs various Waypoint data including a Clear Buffer Command, an acknowledge command to keep the COM port open, and a 'reject' string to close the COM port.

If the mode is set to waypoint and a waypoint is being tracked, then the following string is sent to the DP System.

```
"$PKWPC,%04d,%012.2lf,M,N,%012.2lf,M,E"
```

else, an acknowledge is sent to keep coms open. I.E.

```
"$%c",0xEA
```

If the mode is set to line and a line is being tracked, then line node defining the current segment is the first waypoint sent via the \$PKWPC string.

#### **\$PKWPC – Waypoints (including end of string identifier)**

```
$PKWPC,%04d,%012.2lf,M,N,%012.2lf,M,E
```

Where:

%04d:	is the Waypoint Request / End of String identifier
%012.2lf:	is the 'Y' or (Grid) Northing of the Waypoint
M,N:	is Meters North
%012.2lf,	is the 'X' or (Grid) Easting of the Waypoint
M,E:	is Meters East

#### **\$PKNCW – Clear Buffer Command**

```
%c$PKNCW,\r\n%c",0x02,0x03
```

### **Waypoint Position Outputs:**

WinFrog can only output (to the Cegelec 802 DP) the Cegelec format position. The Output Message Type is 'greyed out' because only the Cegelec Format position output is available for the Cegelec 802 DP. Note that the Cegelec 901 is capable of the GGA position output.

### **Cegelec Position Format:**

Y+6098030.0 X+0606008.7 F000 Q0005005

Where:

+6098030.0 is the current Northing (Grid)

+0606008.7 is the current Easting (Grid)

### **Raw Data Logging (Type 450 record):**

When the DP OUTPUT data type is attached to a vehicle the type 450 raw record is logged to file. This record is described in the WinFrog User's Guide (Appendix B) and is as follows:

### **In WinFrog:**

```
sprintf(rawStr, "450,%s,%.2f,%.8f,%.8f,%.8f,%.8f,%.3f,%.3f,%.3f,%.8f,%.8f\n",name,
           fixTime,centreLat,centreLon,
           waypointX,waypointY,desiredBrg,desiredSpeed,desiredRange,
           currentX,currentY);
```

### **Raw 450 Record:**

```
450,Cegelec 802 DP,982688562.97,55.01780983,-1.34198231,
605594.21404918,6098175.45648311,0.000,0.000,0.000,0.00000000,0.00000000
```

Where:

982688562.97, is the time of the last position,

55.01780983,-1.34198231, is the latitude and longitude of the vessel position,

605594.21404918,6098175.45648311, is the position (Grid) of the current or last Waypoint Tracked under Waypoint Tracking.