GPS Newsletter – Sensor

A Newsletter On System 500 GPS, Vol. 02 No. 06

System 500 and ASCII Input…

Since v3.00 firmware, the so-called **ASCII input** functionality has been available on System 500.

This functionality allows almost any third party device which can output an ASCII string to be connected to any System 500 sensor. As points are then surveyed with System 500, this ASCII data can be recorded as a point annotation with the point.

Sounds quite boring until you start to consider some of the applications for which this functionality could be used.

With v4.00 firmware (featured in the last newsletter Vol. 02, No. 05) it is now possible to store point annotations with auto logged points – thus it is now also possible to store the third party ASCII data with auto logged points. Why this is important for some applications will become clear…

This newsletter first describes some of the applications for which the **ASCII input** functionality is being used and then how to configure the sensor to use this functionality.

Simple Hydrographic Survey

A simple but very effective application for ASCII input is to use a **depth sounder** in a boat connected to a System 500 sensor in order to conduct a survey over the bottom of any stretch of water.

The boat can now be simply steered around the area to be surveyed. The System 500 sensor computes the position information whilst the depth sounder is constantly measuring the depth.

It is of course also possible to use this functionality in **Stake-Out** – the boat could then be steered along pre-determined survey lines!

This application is a good example of why the new v4.00 firmware functionality of storing annotations with auto logged points is so useful. The operator simply turns on auto logging and the depth readings are then stored with each of these measured auto logged positions. With v3.00 firmware, the user would have had to press **F1(OCUPY)** a lot of times to measure all these points.

Note, that the actual depth sounder reading (or any ASCII input data) that is stored with the measured point will be the very last reading received by the sensor from the depth sounder just before that point is stored. This means that the measured position corresponds with a minimum of latency to the depth sounder reading.

This type of operation is already being performed in UK, New Zealand and many other countries.

The vast majority of depth sounding equipment for the operation described above can output the measured depth in an ASCII format – in the UK a Sonarlite device is used –

www.ohmex.co.uk/sonarlite

Bar Code Readers

A slightly more unusual application is being used in mineral mines in Chile with the SOQUIMICH mining company (Sociedad Quimico Industrial de Chile y Empresa Minera Michilla).

The surveyors need to stake-out drill hole positions and attach certain information to the pegs detailing mineral type and content etc. at that location. Currently, this information is simply written on the peg.

The idea now is that a bar code can be generated containing this information and this bar code is attached to the peg. The surveyor can now stake out the pegs, record the true position of the peg and then scan the bar code. The **bar code reader** is attached to the System 500 sensor and the bar code reading is then stored as an annotation to the measured point. The surveyor now has a permanent record of the position of the peg and the bar code attached to the peg.

A second bar code reader application is being used on some large diameter pipelines. The short sections of pipe are laid alongside the already dug trench. The short sections are then welded together before being laid in the trench as a longer section of pipe. However, once the

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welder has finished his work, he will attach a bar code alongside the weld detailing information about the weld (date and time of weld, weld type etc).

Once the pipe is in the trench, but before the pipe is covered, the surveyor must measure the precise location of the weld and read the bar code reading.

Now the surveyor can attach the **bar code reader** to the System 500 sensor and record the bar code reading as an annotation to the measured point.

In both of these applications, the bar code reader could of course store the bar code reading itself. However the surveyor must then ensure that the correct bar code reading can be assigned to the corresponding positional measurement – not always easy at the end of a long day.

This is the great advantage of attaching the bar code reader to the System 500 sensor – the bar code reading is stored with the point – no chance of mistakes.

The bar code reader used in Chile is the Welch Allyn ImageTeam IT-3800.

www.welchallyn.com

Measuring the Incline of Train Tracks

Another interesting application is in Belgium where it is needed to measure the incline (the grade) along the length of the train tracks.

With System 500 and ASCII input, this previously time consuming operation is now simple. The **inclinometer** is attached to the System 500 and as the measuring equipment is moved along the track, the incline of the track at regular spacings is being recorded along with the precise position of these measurements.

Simple.

That has described some of the applications for the ASCII input functionality – the next section of this newsletter describes how to configure the functionality.

How to Configure ASCII Input

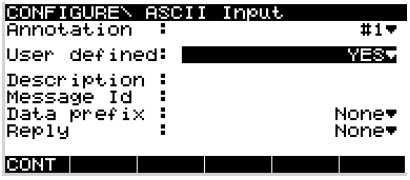
The configuration of the ASCII input functionality is not only simple, but also flexible allowing many possibilities within applications.

To configure the ASCII input, access the **CONFIGURE\ ASCII Input** panel (**CONFIG** and then **4 Interfaces** and then highlight the **ASCII Input** interface and press **F3(EDIT)**).

Set **Use Device** to **YES** and then choose the required port to which the third party device will be attached. It may now be necessary to create a new device (normally based on the system default RS232 device) and configure the correct protocol settings for the device.

Also configure the correct end of message character (normally **CR/LF**).

It is now necessary to configure to which annotation (any of the 4 available annotations can be used) the incoming ASCII data should be stored. Press **F3(ANNOT)** to access the panel shown below.



In the **Annotation** prompt select the annotation to which you wish to record the ASCII string and set the **User Defined** prompt to **YES**.

The **Description** prompt allows you to enter a meaningful description of the data to be recorded – this description will appear later in other panels to remind you that this annotation is recorded to receive data.

The **Message ID** prompt allows certain parts of the ASCII data to be recorded. Imagine the case where a gas analyser is attached to System 500. The gas analyser is used to measure the level of different gasses over a land-fill site. Connecting the device to System 500 allows the coordinates of where the gas samples were measured along with the gas measurements themselves. However, the gas analyser in this example can measure the level of 4 different gasses. The format of

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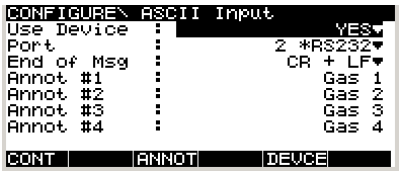
the ASCII string sent from the gas analyser is shown below.

$GAS1 0.0034<CR><LF>
$GAS2 0.0287<CR><LF>
$GAS3 0.0104<CR><LF>
$GAS4 0.0004<CR><LF>

The user wishes that each of the gas readings for each gas is recorded to separate annotations. This is possible with the ASCII input functionality because each gas reading has a unique identifier - **$GAS1**, **$GAS2** etc.

The user must simply enter the correct identifier as the **Message ID** for example **$GAS1** could be entered for annotation 1.



The **Data Prefix** prompt allows header characters to be added to the data being stored to the annotation. In the above example, choosing **@<Desc>@** in the **Data Prefix** prompt would then store the following data to annotation 1

@Gas 1@0.0034

where **Gas 1** is the description entered in the **Description** prompt.

The **Reply** prompt allows the user to configure that an NMEA message is sent back to the device when an ASCII data string is received by System 500 from the device. This may be important for some devices.

Viewing the ASCII Data

When the third party device is outputting data to the System 500 sensor, it is possible to see this data.

Press **STATUS** and then **4 Interfaces** to access the **STATUS\ Interfaces** panel and then highlight **4 ASCII Input** and then press **F4(IFACE)** to access the **STATUS\ ASCII Input**.

Here the **F4(DATA/DESC)** button can be used to toggle between viewing the description assigned to each annotation and the ASCII data itself.

Exporting the Data

It is easy to export the measured positional data and ASCII input data – the most flexible way is to use a format file.... And remember, format files can be used on both the sensor and with SKI-Pro...

Remember...

- ASCII input functionality is easy to configure but extremely flexible.
- The incoming ASCII data can be stored to any of the point annotations.
- Many devices can be attached to the System 500 sensor using an RS232 interface.
- The number of potential applications is unlimited.
- Please contact Heerbrugg if you use the ASCII input functionality for any other unusual applications – we are always interested to hear of such uses.

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