Dewesoft Application note:



Use GPS for timing and synchronisation



In the graphic above you see independent measurement systems, synchronised per GPS. Basically the DEWESoft device needs the PPS (pulse per second) output from the GPS, to correctly synchronize the AD clock to it. Also a single system can use the GPS time as timebase for the measurement.

Either internal GPS (DEWE-101, S-BOX) or external GPS (DS-GPS-SYNC) can be used.

This document lists first the different GPS (depending if 1 Hz, 20 Hz or 100 Hz option, internal or external GPS), then the sync port and timing setup is described.

1. GPS settings

If you already have a DEWE-101 (Minitaur) or S-BOX with integrated GPS, you need to check the correct GPS setting in DEWESoft first (should be correctly setup by delivery). Go to Settings -> Hardware setup -> GPS. Depending on the used GPS type one of the following settings will work:

1.1. 1Hz internal GPS

For the 1 Hz GPS option the following Init String must be entered in hardware setup to correctly setup the PPS output. Enable the checkbox "Send init string", then copy line by line sequentially into the text field.

\$PRTHS,U1OP,ALL=0,GGA=1,GSV=1,RMC=1
\$PRTHS,PPSG,ENABLE
\$PRTHS,PPSO,0,0,500000000

A Hardware setup	×
Analog CAN GPS Video Math Timing Alarms & Events Analog out I	NET Plugins Registration
GPS device	Maps directories
NMEA compatible GPS	
GPS found Refresh	
Com port	
COM3 T	
Baud rate	
38400 Auto search	
Flow control	
None	
V Send init string	
\$PRTHS.PPSG.ENABLE	
\$PRTHS,PPSO,0,0,500000000	
	Add Remove Edit
Registration status	
PROF Auto Det	tect OK Cancel

1.2. 20 Hz internal GPS

For 20 Hz GPS select the Topcon/Javad device (higher update rates are selectable but cannot be applied).

从 Hardware setup			×
Analog CAN GPS Video Math Timing Alarms & Events A	Analog out NET	Plugins Registration]
GPS device	1	Maps directories	
Topcon/Javad			
GPS found Refresh			
Com port			
COM3 Reset receiver			
Model: GMSX			
Serial: EOMKSS3N2M8			
Receiver dynamic Normal (Data logging)			
Update rate (Hz) 20			
Receiver mode			
Leave original receiver settings			
	1		
		Add Remove	Edit
Registration status			
DSK	Auto Detect		OK Cancel

1.3. 100 Hz internal GPS

Also for 100 Hz GPS select the Topcon/Javad device.

火 Hardware setup	×
Analog CAN GPS Video Math Timing Alarms & Events Analog out NET	Plugins Registration
GPS device	Maps directories
Topcon/Javad	
GPS found Refresh	
Com port	
COM4 Reset receiver	
Model: GMSX	
Serial: EOMKSS3N2M8	
Receiver dynamic Normal (Data logging)	
Update rate (Hz) 100	
Receiver mode	
Leave original receiver settings	

1.4. DS-GPS-SYNC

For the clocking of single slices or a DEWE-43, use the DS-GPS-SYNC kit available at DEWESoft, which consists of an external GPS (with PPS out functionality), which you just need to connect; all the cabling is already done.

Connect the Dsub9 to the CAN port, the GPS mouse will be powered from the (often not used) CAN port. The 00 Lemo cable is connected to the Sync connector for the TTL PPS signal. The serial communication to the GPS is done over USB by using an additional RS232-to-USB converter (included in the set).



The Laptop needs 2 available USB2.0 ports, 1x for Sirius and 1x for GPS

- 1.4.1.Install the driver for the RS232-to-USB converter (you can find it also on the USB Stick included in the shipment, in the folder "\Extras\USB-to-Serial_Converter")
- 1.4.2.Sometimes it happens that the mouse cursor starts jumping after the GPS is connected (this is depending on your Windows version); to fix it please follow these steps:

As soon as the Mouse pointer starts jumping disconnect the DSUB RS232 connection between the GPS and the USB converter (but do not disconnect the USB converter!)
Enter the Windows device manager (right-click on Computer, choose "manage" and select device manager)

- In the list of devices go to "Mice and other pointing devices", right-click on "Microsoft serial ballpoint" and choose "deactivate" (do not choose deinstall!)

1.4.3.Then go to the hardware setup and select NMEA compatible GPS, the correct COM port the driver is using and a baud rate of 4800.

A Hardware setup	
Analog CAN GPS Video Math Timing Alarms & Events Analog out NET	Plugins Registration
GPS device	Maps directories
NMEA compatible GPS	
GPS found Refresh	
Com port	
COM13	
Baud rate	
4800 Auto search	
Flow control	
None	
GPS found	
Send init string	

2. Sync port setting

Go to Settings -> Hardware-Setup -> Analog -> and select "DEWESoft USB"; Your DEWESoft device will be automatically found; the Sync-mode should be set to "Standalone".

🔺 Hard	ware setu	р											×
Analog CAN GPS Video Math Timing Alarms & Events Analog out NET Plugins Registration													
Analog device Amplifiers													
DEWES	oft USB			?	\triangleright	D	ewe-USB o	nboard		•			
Card FO	UND] Onboard	amplifier	ensors				
								1013/1203 30	113013				
Card se	etup Gro	uping											
						ſ)ewesoft	USB hardw	are				
Index	Nam	e	FW Vers	io	SN (S	ystem Si	V)		Descri	ption		Sync 🗎	Setup
A	SIRIUS-	[3.1.2.16	DO)9A73DF ((DOOBFE	732C)	8×24 bits Al	(@200 kHz	, 6 DI, 2 C	INT 🤇	Standalone	Set Card
Registra	tion status	;											
DSA													
												ОК	Cancel

3. Timing setting

Select the "Timing" tab, choose "DEWESoft USB" for the timing device and "GPS" as the time source:

🔺 Haro	lware se	tup										
Analog	CAN	GPS	Video	Math	Timing	Alarms & Events	Analog out	NET	Plugins	Registration		
Timing	device											
DEWES	oft USB			-								
Card FOI	JND											
DEWES	oft USB Ca	nrd										
D02043	:00				~							
Card In	fo											
Card na	ame:		DEWESo	ft USB								
Firmwa Serial n	re: umber:		5.8.0.16 D020430	00								
Setting												
Time so	urce		GPS		~							
Registra	tion statu:	5										
PROF	=						Auto D	etect)		ОК	Cancel

4. Measurement

Exit the Hardware-Setup with OK, go back to Channel Setup – GPS screen and check if the GPS has found several satellites, shows the coordinates and "PPS sync" is green:

) (minimi	DEWES	oft 7.1 b81			
	Acquisition	Analysis Setup fi	les Ch. setup Measure	(
Store	Save	Save as File details	Storing Analog Counter	Lttl ou	PS Alarms	Math Torsional vib.
		-				
SLOT	ON/OFF	NAME	VALUE	SETUP	PP	S sync
0	Unused	X absolute	15° 31,485' E	Setup		OGPS
1	Unused	Y absolute	47° 8.532' N	Setup		
2	Unused	Z	555 m	Setup	18	
3	Unused	Velocity	0 km/h	Setup	15	a 8
4	Unused	Direction	0 deg.	Setup	9 2	20
5	Unused	Used satellites	8	Setup		🛈 🖉
6	Unused	Current sec	32411	Setup	g 5	8 Ilsed
7	Unused	NMEALog	\$GPGSV.3.1.09.05.17.201.46.	Setup		Used

Go to measure mode, the green button on top shows that the synchronisation works ok.



Starting from DEWESoft X2 it is possible to import data from independent measurement stations into ONE datafile. When the datafiles have the same time stamping (synchronised measurement), you just import and DEWESoft aligns them correctly.

See next page for example configurations.

5. Example configurations

Directly synching to external GPS is working using 1 Dewesoft device. If you use e.g. 2 separate SIRIUS slices, synched by sync cable, the sync port is already in use for the internal synchronisation between the slices. Therefore the DS-CLOCK has to be used to convert the GPS signal to IRIG.

Using the internal GPS of a "multislice" device for timing (SBOX + multiple SIRIUS slices in one aluminium chassis) works because the connections are done internally.



For support please contact support at dewesoft com.