





Manual NEP-595 Long-life logging probe

Version: 20201002 Status:Rev2 Confidentiality: Not confidential Date: 02 October 2020 Author: Observator R&D

www.observator.com





Document history

The Observator range is in continuous development and so specifications may be subject to change without prior notice. When in doubt about the accuracy of this document, contact the Observator Group.

NEP-595 Reference documents

Type of document / tool	Product type and name (incl. url)			
Type of document / toolProduct type and name (incl. dri)DatasheetDatasheet-NEP-595-V20200417.pdfManualThis Document				
Manual	This Document			





Firmware & manual version

Important Note: Refer to the following manual revisions based on your product serial numbers

Manual version	Serial number	Firmware version
NEP-595 Manual	All serial numbers	OBS-NEP595-15052020-V1.007
V2020-02-10		





Product Summary

Thanks for purchasing the new Analite NEP-595 long-life logging probe. It will give you years of service if you install and maintain the probe according to guidelines set out in this manual.

The NEP-595 is an all-in-one device that contains a purpose-built configurable SDI-12 logger with an integrated rechargeable and replaceable battery designed for long-term operations.

The system is housed in a fully water-sealed casing that can support up-to fifty meters of water pressure.

The NEP-595 is designed to fit with the NEP-5000 SDI-12 option, providing an optimized logging solution to monitor the turbidity. The NEP-595 has a built–in 6-pin female SubConn connector as a sensor interface. It provides the ability to connect multiple SDI-12 sensors into the same connector and monitor multiple parameters.

When the NEP-595 is integrated with the NEP-5000 sensor, the following features can be obtained: • SDI-12 configuration.

When using the battery on its own, with the NEP-5000 sensor, the system is capable of logging up to 5 months in 20 minute-intervals or indefinite use when connected with a 20W solar panel. The main advantage of having a built-in rechargeable and replaceable battery is that its low running cost. Hence, users are not required to buy expensive batteries.

Built-in Lithium-ion batteries have a capacity of 144Wh which can be charged via simple DC plug-pack or optional solar input. Thus, providing ideal solution for data-buoys and river monitoring applications.

Possible application for NEP595 & NEP5000: The NEP-595 products are ideal for water quality, food processing, waste treatment, and environmental compliance for dredging operations. They are also an ideal dropping solution for data-buoys and river monitoring applications. Typical use includes applications such as:

- 1. Monitoring of streams and rivers
- 2. Monitoring of water storage bodies, including stratification studies
- 3. Intermediate and final effluent treatment monitoring
- 4. Environmental impact studies
- 5. Hydrological run off studies
- 6. Ground and bore water analysis
- 7. Water filtration efficiency
- 8. Industrial process monitoring
- 9. Sludge and dredge monitoring











Contents

1	Specification	8
2	What you will find in the box	10
3	Accessories	12
4	Deployment procedure & mechanical installation	14
4.1	Quick checklist to prepare for easy deployment	14
4.2	Connect NEP-595 to a NEP-5000 sensor	16
	4.2.1 Connect NEP-595 to a single NEP-5000	16
	4.2.2 Wiring of NEP-595 to a single NEP-5000 using an extension cable	
	4.2.3 NEP-595 Multiple sensor configurations	
	4.2.4 Mounting NEP-595 into a data buoy	
	4.2.5 Power NEP-595 using a solar panel for long-term deployment	
4.3	Disconnect NEP-5000 from the logger	
5	Charging NEP-595 battery	21
5.1	Charging NEP-595 battery via the connector	
5.2	Replace/Remove NEP-595 battery	
5.3	Charge NEP-595 battery externally	
5.4	How to know if the battery is fully charged	
6	Maintenance & storage	25
6.1	Manage SD cards	25
	6.1.1 Clearing up SD card memory prior to deployment	
	6.1.2 Manually change SD cards	
	6.1.3 Selecting a micro SD card for your NEP-595 device	
6.2	Safely closing of the protective cap	
6.3	Switching off the power switch	
6.4	Reorient NEP-595 metal handle	27
6.5	Check moisture tabs for water ingress	28
6.6	Check the condition of o-rings and replace them	
6.7	Clean and wash the probe	28
7	NEP-595 LED status & meaning	29
7.1	How to make sure NEP-595 is working correctly by monitoring LEDs	29
7.2	How to check for errors by monitoring LEDs	29
8	Software installation	
8.1	Connect NEP-595 logger to your Windows PC to download logged data	
8.2	File format types available in NEP-595	32
	8.2.1 Self-describing ".csv" format	32
8.3	Procedure for updating firmware	33
9	NEP-595 common popular configurations	34
9.1	Default configuration for single turbidity measurement with optical wiping	34
	9.1.1 Configuration objectives	
	9.1.2 NEP-5000 configuration	
	9.1.3 Flow chart	





	9.1.4 Power estimation	36
	9.1.5 SDI-12 Configuration for NEP-595 logger	36
9.2	Single turbidity measurement & built-in temperature measurement with optical wiping	37
	9.2.1 Configuration objectives	37
	9.2.2 NEP-5000 configuration	37
	9.2.3 Flow chart	38
	9.2.4 Power estimation	39
	9.2.5 SDI-12 Configuration for NEP-595 logger	39
9.3	Multiple turbidity measurements in statistical analysis with optical wiping	40
	9.3.1 Configuration objectives	40
	9.3.2 NEP-5000 configuration	40
	9.3.3 Flow chart	41
	9.3.4 Power estimation	42
9.4	Getting started with NEP59x configuring tool.	43
	9.4.1 Connecting your NEP59x logger to PC	43
	9.4.2 PC configuring tool	44
	9.4.3 To connecting the PC tool with your logger.	45
	9.4.4 Exporting (Save out to a file) currently loaded logger configuration to a CFG file	47
	9.4.5 Importing a pre-configured logger configuration to software from a CFG file	48
	9.4.6 Altering the logger name and reading its serial number.	49
	9.4.7 Changing the log file settings in SD cards and enable or disable of number of SD	
	cards in use	50
	9.4.8 Reading the current battery information	51
	9.4.9 Reading or Setting the logger internal clock.	52
	9.4.10SDI12 measurement sequence.	53
	9.4.11Testing SDI12 setting in Realtime	54
	9.4.12 firmware updating procedure.	55





1 Specifications

Dimensions	
Length	458.6mm
Diameter	70mm



Mechanical	
Weight	1.7kg – including batteries





Specifications									
Operating temperature	1C to to 50°C								
Storage temperature	-10°C to 55°C								
Construction	Outer tube construction with polycarbonate tube with a structural support built using a stainless- steel chassis.								
	The probe interface assembly and rear electrical interface assembly is built using machine Delrin plastic.								
Depth rating	52m (170ft) static water column.								
Features	Simple turbidity/temperature reading in auto- range.								
	Statistical measurement over a set period of time.								
	Ability to have 90-degree NEP-5000 with 180- degree NEP-5000 sensor providing seamless transition between drinking water monitoring to sediment monitoring.								
	Adding secondary SDI-12 parameters such as conductivity, PH, Dissolved Oxygen via SDI-12 bus (up to 9 sensors in total).								

Power	
Batteries	Built-in Lithium-Ion batteries.
Capacity	96Wh.
Batteries	DC plug-pack or solar input.
Communication protocol	SDI-12 & USB





2 What you will find in the box

When the product is delivered, this is what you will find in the box:



Items found in the box

NEP-595 logging probe **NEP-595** Turbidity & temperature long-life logging Probe – including 2 SD cards.

DC charging adapter **NEP-595-charge**

Charger adapter for NEP-595, including the adaptor for the purchased country.

Case **NEP-595-Case** Protective case for NEP-595.

1m Micro Universal Serial Bus (USB) cable USB-CBL Interface cable to connect the probe to the computer.



















3 Accessories

for NEP-5000 & NEP-595. The range of products are directly available from the website:



Accessories

Calibration kit for SubConn probes** **NEP-CFG-SF** - comprising of a blue box calibration module, USB cable and a SubConn female pigtail.

(**) Only for NEP-5000 with male SubConn connector. Wiring is different for SDI-12 and RS422/RS485.











Note: Additional customised accessories are also available for long-term deployment or multiple sensor configuration such as: Photovoltaic (PV) panel, long-deployment protective cap.





4 Deployment procedure & mechanical installation

4.1 Quick checklist to prepare for easy deployment

- Lower the metal handle if required (refer to **Section 6.4** "Reorient NEP-595 metal handle").
- Make sure the battery is fully charged /charge the battery.
 - Remove the top cap of the logger (opposite side of the sensor connector).
 - Make sure the power switch is in off position (refer to **Section 6.3** "<u>Switching off the power</u> <u>switch</u>").
 - Charge NEP-595 battery (refer to Section 5 "Charging NEP-595 battery").
- Make sure the SD card memory is cleared and correctly formatted (refer to Section 6.1 "Manage SD cards").
- Connect NEP-595 to a NEP-5000 sensor.
 - Make sure the power switch is in off position.
 - Attach NEP595 logger to NEP-5000 sensor (refer to Section 4.2 "<u>Connect NEP-595 to a</u> <u>NEP-5000 sensor</u>").
- Switch on the power and observe your first measurement.
 - Switch on the power switch.
 - The logger will now carry on its first measurement.
 - During the measurement, the green LED will turn on, users can also observe the wiping action. The green LED will then turn off when the measurement is finalised (refer to Section 7.1 "How to make sure NEP-595 is working correctly by monitoring LEDs").
 - If any error occurs during the measurement, the red LED will turn on (refer to **Section 7.2** "<u>How to check for errors by monitoring LEDs</u>"). Users should not deploy the probe until the error is resolved. Disconnect the sensor, check the problem and reconnect again.
 - Close off the upper cap is and make sure tighten properly (refer to **Section 6.1.3** "<u>Selecting a micro SD card</u> for your NEP-595 device

NEP-595 is designed to carry two micro SD cards and use them in parallel to increase data redundancy. This also provides options by swapping cards to collect data in the field without using a PC.

Although the NEP-595 logging device is designed to work with almost all types of SD cards in the market, the best practice is to use SD cards that are intended for endurance use or have wider operating temperature range (25° C to 85° C). Also, it is important to note that many manufacturers offer data recovery services if you purchase their industrial grade, endurance grade or pro grade micro SD cards. The NEP-595 device supports SD cards up to 128GB of capacity.

Some of recommended SD cards:

- Samsung PRO Endurance
- SanDisk Extreme PRO (64GB micro SD)





- Kingston High-Endurance MicroSD
 - Safely closing of the protective cap").

The following block diagram represents the connection of the NEP-595 connected to a single sensor:



Figure 4.A: Connect NEP-595 to a single NEP-5000





4.2 Connect NEP-595 to a NEP-5000 sensor

4.2.1 Connect NEP-595 to a single NEP-5000

The following section describes how to connect a single NEP-5000 sensor to the NEP-595 logging probe. Please proceed as follows in order to avoid damaging the NEP-595 connector:

- Turn the power switch off.
- Firmly hold the NEP-5000 probe. Adjust the NEP-5000 male connector to fit the female NEP-595 connector.



Turn the NEP-595 moving part clockwise to attach the logging probe to the NEP-5000 sensor. Always
loosely hold the NEP-595 moving part while firmly holding the NEP-5000 sensor (in order to avoid
damaging the NEP-595 connector).



• To verify the connection, Switch the power switch back on. Wait 15 seconds for the sensor to warm up until you hear the probe wiping.





4.2.2 Wiring of NEP-595 to a single NEP-5000 using an extension cable

NEP-595 logger can also be connected to a single NEP-5000 probe using an extension cable. Please contact Observator Instruments for more information about accessories available.



4.2.3 NEP-595 Multiple sensor configurations

Users may apply the following configuration diagram to power multiple NEP-5000 sensors (up to 9 sensors in parallel):



Figure 4.B: Connect NEP-595 to multiple NEP-5000

Note: Please contact your sensor manufacturer to request our special made cables for multiple sensor configuration.





4.2.4 Mounting NEP-595 into a data buoy

The NEP-595 is designed for long term monitoring applications such as data buoy deployments.



Important note: Never apply pressure to the body of the sensor. Always attach the NEP-595 using the metal handle in upper position. Do not use cable clamps. Do not crush the body of the sensor.



Note: A range of data-buoys fitting NEP-595 logging applications are available from the manufacturer. Please contact Observator Instruments for more information.







4.2.5 Power NEP-595 using a solar panel for long-term deployment

Powering the NEP-595 using a PV panel for long-term usage or remote deployment:



Figure 4.C: Power NEP-595 using a solar panel

Note: Additional customised accessories are available from Observator Instruments for long-term usage such as PV panels and long-deployment protective caps.





4.3 Disconnect NEP-5000 from the logger

To disconnect NEP-5000 sensor from the NEP-595 logging probe, please proceed as follows in order to avoid damaging the NEP-595 connector:

- Switch off the power switch.
- Turn the NEP-595 moving part anti-clockwise to detach the logging probe to the NEP-5000 sensor. Always loosely hold the NEP-595 moving part while firmly holding the NEP-5000 sensor (in order to avoid damaging the NEP-595 connector).



• Pull out NEP-5000 probe and disengage NEP-595 connector.







5 Charging NEP-595 battery

When shipped, NEP-595 battery will not be fully charged. Before charging the battery make sure that the power switch is off:

- a. Undo the protecting top cap off the logging probe (simply turn anti-clockwise).
- b. Make sure the power switch is in off position.

Users have the option of charging NEP-595 battery directly via the connector (refer to **Section 5.1** "Charging NEP-595 battery via the connector") or externally using the adaptor cable provided (refer to **Section 5.3** "<u>Charge NEP-595 battery externally</u>").

Once the NEP595 is fully charged, the LED in charger will turn to green from green (refer to **Section 5.4** "<u>How to know if the battery is fully charged</u>") to indicate the battery is fully charged. Do not forget to close the protecting top cap back onto the logging probe when finished.

Note: Make sure to verify the battery is properly charged prior to deploy NEP-595 in the field.

5.1 Charging NEP-595 battery via the connector

1. Connect the charging connector to the logging probe by placing the provided charging adapter into the power pin and apply power.



2. When fully charged, remove the charging cable and place the protective cap back onto the probe.





5.2 Replace/Remove NEP-595 battery

The following instructions must be followed to change the battery:

- 1. Make sure NEP-5000 sensor is disconnected, alternatively, disconnect NEP-5000 sensor from the logger (refer to **Section 4.3** "Disconnect NEP-5000 from the logger").
- 2. Open the battery compartment (turn anti-clockwise).



3. Pull the yellow strap to lift the battery (just enough to be able to disconnect the connector).



4. Disconnect the cable from the battery connector.







5. Pull the battery out of the battery compartment.



- 6. If required, charge the battery externally (refer to Section 5.3 "Charge NEP-595 battery externally").
- 7. Replace the fully charged battery back in the same position inside the logger, hold it in position using the yellow strap and plug in the cable to the connector (the connector should be facing the cable).



Push the cable into the connector to engage

8. Drop the battery in the battery enclosure using the yellow strap. Tuck the extra cable inside the enclosure.



9. Close off the battery compartment (turn the lid clockwise). Make sure that Orings are not damaged.





5.3 Charge NEP-595 battery externally

Users may charge the battery using the external charging adaptor provided. Please refer to **Section 5.2** "<u>Replace/Remove NEP-595</u> battery" and follow steps 1-5 to safely remove the battery from the battery compartment.

1. Connect the battery to the charger via the external adaptor cable provided.



2. Apply power and charge the battery until fully charged (refer to **Section 5.4** "How to know if the battery is fully charged").



5.4 How to know if the battery is fully charged

Please follow the steps described in **Section 5.1** "<u>Charging NEP-595 battery via the connector</u>" or **Section 5.3** "<u>Charge NEP-595 battery externally</u>" to connect respectively the charger to NEP-595 logger or to the battery directly.

It will take on average eight hours to fully charge from complete flat battery. The charger's LED will automatically turn green after completion of the charge cycle.







6 Maintenance & storage

6.1 Manage SD cards

6.1.1 Clearing up SD card memory prior to deployment.

Before a new deployment, proceed as follow to clear the memory on the NEP-595 probe:

- 1. Undo the protecting top cap off the logging probe.
- 2. Make sure the power switch is in off position.
- 3. Insert 2 SD cards in the logger.
- Connect the logger to the computer as described Section 8.1 "Connect NEP-595 logger to your Windows PC" (step 3-5 only).
- 5. Manually empty both SD cards. Delete all files or format the SD card. Use reputable formatting tool such as Windows build in tool or SDORG formatting tool. https://www.sdcard.org/downloads/formatter/

6.1.2 Manually change SD cards

To change the SD cards, undo the protecting top cap off the logging probe and make sure the power switch is in off position. We recommend changing SD cards using a tweezer or similar tool. If you do not access to a tweezer tool you may change SD cards manually, however, this option is not recommended.



Note 1: Care must be taken when placing the SD card into the allocated slot.

Note 2: By default, the NEP-595 is configured to work with 2 SD cards. How ever user may select to use only 1 SD cards by using the configuration software.





326B

@IJ**A**1F€ x

6.1.3 Selecting a micro SD card for your NEP-595 device

NEP-595 is designed to carry two micro SD cards and use them in parallel to increase data redundancy. This also provides options by swapping cards to collect data in the field without using a PC.

Although the NEP-595 logging device is designed to work with almost all types of SD cards in the market, the best practice is to use SD cards that are intended for endurance use or have wider operating temperature range (25° C to 85° C). Also, it is important to note that many manufacturers offer data recovery services if you purchase their industrial grade, endurance grade or pro grade micro SD cards. The NEP-595 device supports SD cards up to 128GB of capacity.

Some of recommended SD cards:

Samsung PRO Endurance



SanDisk

Extreme 64gb Misse

3

- SanDisk Extreme PRO (64GB micro SD)
- Kingston High-Endurance MicroSD

6.2 Safely closing of the protective cap

Tighten the protective cap so that it does not come off due to vibrations or other mechanical influences. Screw the cap by turning clockwise until the cap is fully screwed on.



Important: Do not over-tighten the cap as the sealing is ensured by the O-ring (not the level of tightness). By tightening too much, the cap will damage its thread and may result in difficulty in removing the cap.





6.3 Switching off the power switch

Always switch off the NEP-595 after use. Users should also make sure that the switch is off prior to:

- 1. Connecting/disconnecting the sensor.
- 2. Inserting or removing a SD card.
- 3. Connecting the Micro USB cable.

Use the power switch (underneath the cap) to switch off the logging probe to avoid the system running continuously when it's not been used.



6.4 Reorient NEP-595 metal handle

To facilitate mounting, users can manually re-orient NEP-595 metal handle:

- 1. Remove the mounting screws.
- 2. Choose the preferred orientation among the 2 positions available:
 - a. The upper position is preferred for deployment.
 - b. The lower position facilitates access to the protective cap.
- 3. Place the screws back on.







6.5 Check moisture tabs for water ingress

Please check moisture tabs prior to deployment. If the tab has turned red, it means that moisture has penetrated within the logger electronics and battery. Do not deploy the logger at this condition.



Normal state

Detect water state

Important note: If you detect water inside the body of the NEP595, Please contact Observator Instruments for a evaluation.

6.6 Check the condition of o-rings and replace them

To insure a reliable operation, check the o-rings on a regular basis. Damaged o-rings can be replaced using correct oring kit for NR+EP595 : please refer to "<u>NEP-595 o-ring replacement procedure</u>" application note. You can also send the probe back to Observator Instruments for repairs.

6.7 Clean and wash the probe

In the field, wash the probe with fresh water and clean it with a soft cloth. Best to avoid hash chemicals such as laboratory alcohol.





7 NEP-595 LED status & meaning

7.1 How to make sure NEP-595 is working correctly by monitoring LEDs

User may monitor the activity of the logger by checking the 2 LEDs through the transparent window.

Light-Emitting Diode (LED) status	Colour	Meaning
LED on green		NEP-595 is performing a measurement
LED flashing green (twice per second)	$\bigcirc ullet$	NEP-595 data logger is connecting to the PC via USB cable
LED on red	•	SDI-12 sensor is not responding, system error, error in logging session
No LED	0	NEP-595 is sleeping, no logging, no problem has been detected



7.2 How to check for errors by monitoring LEDs

When the red LED is on it means that the logger has detected a problem. Problems encountered can be of three types:

- Errors in logging session.
- System error.
- Sensor does not respond.

Please make sure your measurement is correct, alternatively reset the probe and **contact support** if the problem persists.





8 Software installation

8.1 Connect NEP-595 logger to your Windows PC to download logged data

The process is very similar to plugging a USB thumb drive device. Proceed as follow to connect NEP-595 logger to your PC:

- 1. Undo the protecting top cap off the logging probe (simply turn anti-clockwise).
- 2. Make sure the power switch is in off position.
- Plug in the USB cable into the micro-USB port and connect the logger to your computer USB port.



- 4. Put back the switch to on position.
- Note the COM port in Device manager & two available Drivers in My Computer in your Windows PC.



Note: When connecting the data logger to the PC via USB cable the logger Green LED will start blinking twice per second until the connection is established.





6. If you are using the logger for the first time, please wait for the software to automatically install the mass storage drivers onto your Windows PC. This may take a few minutes.



7. You can now retrieve the data directly from your logging probe the same way you retrieve data from your USB storage device. Copy ".csv" log files from each SD card folder.

File Home	Share	View					~ (
In to Quick Copy access	Paste	Cut Copy path Paste shortcut	Move Copy to to to to	Dejete Rename	New folder New	Properties	Select all Select none Pinvert selection Select
< → • ↑ I	« LOG	GED_DATA_111147	-111149_180520	020 > 111147 >	1 → DATA	~ 0	,P Search DATA
Quick access Desktop Downloads Documents Pictures This PC DATA NEPS9X_Ma	# # # #	Name INDEXLIF I LOG0000.C LOG000.C LOG00.C LOG0.C LOG00.C LOG00.C LOG00.C LOG00.C LOG00.C	sv sv sv	1	Date modified	0.000000,0,1 000,0,2,Temp iogger name, HERITAGE.ser number,11114 time,2020-18 06:27:02,bat voltage,15.8 0.000000,0,1	1a1 7, date and -05 tery 84173,0, wipeStatus, Turbidity,1014.780 erature,18.520000,0 NSW-ENVIRO- 1a1 -05 tery 27528,0, wipeStatus, .Turbidity,1015.390
 phone Release OneDrive This PC 						logger name, HERITAGE,ser number,ill14 time,2020-18 06:57:43,bat voltage,15.8 0.000000.0,1	ial 7,date and -05
3D PRINTER (F 21052020 Network	5)					logger name, HERITAGE,ser number,11114 time,2020-18 07:28:24,bat voltage,15.7 0.000000,0,1	NSW-ENVIRO- ial 7,date and -05
	<			_		iogger name,	NSW-ENVIRO-

Figure 8.A: Data collected in ".csv" log files

Copy all the data from the SD card onto your computer.

8. When finished, select eject the mass drive from your PC. Turn off the logger switch. Only then, disconnect the micro USB cable from your computer and from the NEP-595 probe and place the protective cap back onto the probe.

Green LED is flashing while the logger is connecting





Pt 🚺		8
	Open Dev	vices and Printers
	F	s Storage

Figure 8.B: Eject NEP-595 probe from your PC

8.2 File format types available in NEP-595

There are 2 formats available with NEP-595:

- 1. Self-describing ".csv" format.
- 2. "Eagle.io" format.

8.2.1 Self-describing ".csv" format

Each ".csv" file contains data formatted as follow:

☐ 5 + 0 - = L000004.CSV - Excel																									
File	Home	Insert	Page Layout	Formulas	Data	Review	View	Help 🖓 Tell m	ne wh	at you want to	da														
1 1 2 2	Cut		Calibri	∨11 ∨ A'	A =		87-	환 Wrap Text	1	General	~				Norma	d	8	d		G	ood		Ne	eutr	
Paste	Copy *		в г џ -	····	. =	==	-	E Merge & Center		\$ - % +	40 A1	Condition			Check	Cell	Б	plan	atory	tr	put		Dr	wei	
Clipt	board			ont			Align	nment 6		Number		ronnatung *						50		Styles	lyles				
11			V #	15.784173																					
					- 100					1.11							12.5	5411		200		Calif			
A			B	c	D	E		F		G	н	1 1		KLI	11 A A			PQ		R	-	T	U	-	
								2020-18-05 05:56:21			In a distant state of the local division of	 Column Column 				10.0	014.78								
								2020-18-05 06:27:02				the strength of the second													
								2020-18-05 06:57:43			15.848673						1016.2								
								2020-18-05 07:28:24		and a start of the second	15.75653	from Sector Contractor				1.0.0									
								2020-18-05 07:59:05		a sector and a sector sector sector	15.772187	papers from				1000									
								2020-18-05 08:29:46			15.801358	2 - 6 - 7					1011.5								
								2020-18-05 09:00:28		and the second	15.765744	Service and the service of the servi										9 0			
100 C 100 C 100 C 100 C								2020-18-05 09:31:09		and the second se	15.82103	the second second													
and the second se								2020-18-05 10:01:50 2020-18-05 10:32:31		and the second second second second	15.78141 15.810331	production and the second													
								2020-18-05 10:32:31			15.795866	and the second second													
logger	enancing (ADAL-FLAA	INO-HERITAG	c sena numbe	11114/	sace and	a ruth6	2020-10-03 11:03:15	oatti	ery vortage	13.733800	o wipes	nantus	0.0	1 101010	ity 1	014.33	0.21	entpe	crature	20.5	3.0			
1																								-	

Figure 8.C: Data collected within each ".csv" file

When finished downloading data, clear up the SD card memory and set up the SD cards for the next logging section (refer to **Section 6.1.1** "<u>Clearing up SD card memory</u>").





8.3 Procedure for updating firmware

Please check "<u>NEP-595 firmware updating procedure</u>" application note.





9 NEP-595 common popular configurations

9.1 Default configuration for single turbidity measurement with optical wiping

9.1.1 Configuration objectives

The default configuration is pre-loaded onto all NEP-595 logging probes (unless otherwise requested). The configuration turns on the sensor. After the warm up time elapses, it performs an optical wiping followed by a single turbidity measurement, and stores data at each scan (every 5 minutes). Then the configuration save data into built-in 2 SD cards in ".csv" format within the datalogger:

- The configuration records the wiping status (if jammed or not) of the probe (Wipe_stats) and the turbidity (Turbidity) in NTU within the SD card in "csv" format at each scan (every 5 minutes).
- The configuration records the minimum default NEP-595 Battery Voltage (BattV) into the same ".csv" file.

The configuration uses the SDI-12 command "M1!" to trigger a wipe and the command "M!" to perform a turbidity measurement.

9.1.2 NEP-5000 configuration

Please refer to **Section 4.1** "Quick checklist to prepare for easy deployment" to properly setup and connect the logging probe to the NEP-5000 sensor.

Connect the NEP-5000 probe to your Windows computer using the calibration box "Blue Box". Configure the NEP-5000 ranges using the NEP-5000 software. Apply SDI-12 settings.

Please refer to the <u>NEP-5000 manual</u> for more information.



Figure 9.A: To commit above settings to permanent memory please press set followed by save calibration





This provide following SDI-12 settings:

- SDI-12 data accusation time = 10s
- SDI-12 address = 0
- Power on wipe off

9.1.3 Flow chart



Figure 9.B: Default configuration for single turbidity measurement with optical wiping





9.1.4 **Power estimation**

The following table represents the power estimation for turbidity in auto-range (ten seconds) with optical wipe.

Logging time (min)	Measurement days
1	5
5	29
10	56
20	108
30	154
40	197
50	236
60	272

Note: All of the above estimations are calculated for ideal temperatures of 25°C. Battery aging and self-discharge are not considered. When deploying for more than three months, the estimation can vary by approximately 30%.

9.1.5 SDI-12 Configuration for NEP-595 logger

This section will be made available to customer upon request.




9.2 Single turbidity measurement & built-in temperature measurement with optical wiping

9.2.1 Configuration objectives

This configuration can be loaded onto all NEP-595 logging probes using the NEP-595 application. The configuration turns on the sensor. After the warm up time elapses, it performs an optical wiping followed by a single turbidity measurement, a temperature measurement, and stores data at each scan (every 30 minutes). Then the configuration save data into built-in 2 SD cards in ".csv" format within the datalogger:

- The configuration records the wiping status (if jammed or not) of the probe (Wipe_stats) and the turbidity (Turbidity) in NTU and the liquid temperature (Liquid_Temp) within the SD card in "csv" format at each scan (every 30 minutes).
- The configuration records the minimum default NEP-595 Battery Voltage (BattV) into the same ".csv" file.

The configuration uses the SDI-12 command "M1!" to trigger a wipe, the command "M!" to perform a turbidity measurement and "D1!" to perform a temperature measurement.

9.2.2 NEP-5000 configuration

Please refer to **Section 4.1** "Quick checklist to prepare for easy deployment" to properly setup and connect the logging probe to the NEP-5000 sensor.

Connect the NEP-5000 probe to your Windows computer using the calibration box "Blue Box". Configure the NEP-5000 ranges using the NEP-5000 software. Apply SDI-12 settings.

Please refer to the <u>NEP-5000 manual</u> for more information.



Figure 9.C: To commit above settings to permanent memory please press set followed by save calibration





This provide following SDI-12 settings:

- SDI-12 data accusation time = 10s
- SDI-12 address = 0
- Power on wipe off
- Auto range selected

9.2.3 Flow chart



Figure 9.D: Single turbidity measurement & built-in temperature measurement with optical wiping





9.2.4 **Power estimation**

The following table represents the power estimation for turbidity in auto-range (ten seconds) with optical wipe and temperature measurement.

Logging time (min)	Measurement days
1	6
5	32
10	63
20	120
30	171
40	217
50	259
60	297

Note: All of the above estimations are calculated for ideal temperatures of 25°C. Battery aging and self-discharge are not considered. When deploying for more than ten months, the estimation can vary by approximately 30%.

9.2.5 SDI-12 Configuration for NEP-595 logger

This section will be made available to customer upon request.





9.3 Multiple turbidity measurements in statistical analysis with optical wiping

9.3.1 Configuration objectives

This configuration can be loaded onto all NEP-595 logging probes using the NEP-595 application. The configuration turns on the sensor. After the warm up time elapses, it performs an optical wiping followed by multiple turbidity measurements and stores data at each scan (every five minutes). Then the configuration save data into built-in 2 SD cards in ".csv" format within the datalogger:

• The configuration records the wiping status (if jammed or not) of the probe (Wipe_stats) and the full statistical measurements (Turbidity, Median, Average, Minimum, Maximum) in NTU within the SD card in "csv" format at each scan (every 5 minutes).

• The configuration the minimum default NEP-595 Battery Voltage (BattV) into the same ".csv" file.

The configuration uses the SDI-12 command "M1!" to trigger a wipe and the command "M6!" to perform the full statistical measurements.

9.3.2 NEP-5000 configuration

Please refer to **Section 4.1** "Quick checklist to prepare for easy deployment" to properly setup and connect the logging probe to the NEP-5000 sensor.

Connect the NEP-5000 probe to your Windows computer using the calibration box "Blue Box". Configure the NEP-5000 ranges using the NEP-5000 software. Apply SDI-12 settings.

Please refer to the <u>NEP-5000 manual</u> for more information.



Figure 9.E: To commit above settings to permanent memory please press set followed by save calibration





This provide following SDI-12 settings:

- SDI-12 data accusation time = 10s
- SDI-12 address = 0
- Power on wipe off
- Auto range selected

9.3.3 Flow chart

> Start scan	
J	
Measure battery voltage	Variables & units
	
Sensor power on	Wipe_stats - Wiper status (jammed/not jamme Turbidity - Turbidity value (NTU)
· · · · · · · · · · · · · · · · · · ·	Median - Median turbidity value (NTU)
Warm up delay (4 seconds)	Average - Average turbidity value (NTU) Minimum - Minimum turbidity value (NTU)
Activate wiper using aM1!	Maximum - Maximum turbidity value (NTU)
	BattV - Battery voltage (Volts)
Wiper complete delay (10 seconds)	Datte Battery voltage (volta)
	20
Read wiper status by issuing a aD0! and	
save value at "Wipe_stats"	
· •	
Initiate turbidity & temperature measurement using aM! SDI-12 command	
mousurement using and ODF 12 command	
Weasurement delay	
(10 seconds for autorange,	
5 seconds for single range measurement)	
¥	
Read turbidity data using aD0! and save	
· ·	
Initiate statistical measurement (produce a statistical output using multiple readings)	
using aM6! SDI-12 command	
Wait about 50 seconds. This depends on statistical analysis settings	
on your NEP-5000 sensor.	
Default is five autorange measurements	
= 5 x 10s = 50 seconds	
Read turbidity data using aD0! and save. This will read last turbidity measurement	
value from statistical read.	
Reads Temperature, Turbidity-median,	
Turbidity-average, Turbidity-minimumand Turbidity-maximum	
using aD1! and save	
Sensor power off	
↓ ↓	
Save data to both SD cards	
· · · · · · · · · · · · · · · · · · ·	
1 62 8 8 9 200 19 55 10 10 8 8	
Set alarm for 30 minutes & go to sleep	
Set alarm for 30 minutes & go to sleep After 30 minutes	

Figure 9.F: Multiple turbidity measurements in statistical analysis with optical wiping





9.3.4 **Power estimation**

The following table represents the power estimation for turbidity in auto-range (fifty seconds) statistical mode (five samples) with optical wipe and temperature measurement.

Logging time (min)	Measurement days
2	6
5	16
10	31
20	61
30	90
40	117
50	142
60	166

Note: All of the above estimations are calculated for ideal temperatures of 25°C. Battery aging and self-discharge are not considered. When deploying for more than three months, the estimation can vary by approximately 30%.





9.4 Getting started with NEP59x configuring tool.

NEP595 provides a PC software that allows users to fully configure the NEP595 logger.

Some key features are,

- Exporting and importing and logger configurations. This allows users to backup existing logger configuration to a CFG file or apply or setup loggers using a pre-configured CFG file.
- Ability quickly change the logging parameters such as logging interval, Log file configurations, adjust system time and etc.
- Ability to configure SDi12 sequence that retrieve data from sensors.
- Ability live test each SDI12 sequence prior to deployment.

9.4.1 Connecting your NEP59x logger to PC.

Please refer to section 8.1 of this manual. Step 1 through 5.

NEP59x PC software uses COM port to communicate with logger electronics. Please note down the comport number form the "Device manager" from your PC.





9.4.2 PC configuring tool.

The latest version will be available in

"http://download.observator.com/files/?dir=Software/NEP59x/Windows%20configuration%20tool"

Download the executable file and double click to run.

of http://downlo × +						
Not secure download.observator.com/files/?dir=Software/NEP59x/Windows%20configuration%20tool						
	Home / Software / NEP59x / Windows configuration tool					
	File	Size	Last Modified			
	t	-	2020-07-05 17:40:46			
	III NEP59x.exe	1.64MB	2020-07-05 16:59:17			

NEP59x				-	×
File View	Tools	Help			
👌 сомз	- CONN	T			
		• • • • • • • • • • • • • • • • • • • •			••••

					 • • •
		• • • • • • • • • • • • • • • • • • • •			 •••
					 ••
********					 • •
	********				 • •
********	********				
					 • •
					1000
Jay, 16 October 20	20 12:25:31 PM	Select COM port of your nep595 device and press connect.			





9.4.3 To connecting the PC tool with your logger.



Note that if incorrect port is selected, the software will let user know.

When valid device is recognised by the software after pressing of the connect button, the Software will automatically read all available configuration from the Nep595 device.







Upon completion of retrieving the device configurations the software will enable its configuration controls (Top menu).

NEP59x			2	×
ile Vi	ew Tools	Help		
	ИЗ	Getting started wizard(New Setup only)		
		Logger name and serial number		
		Configure data log		
		Live data test	 	 •••
• • • • • • • •	Z	SDI12 Measurement sequence		•••
	Ē	Battery info		
		System time		
	(m)	Configure Telemetry		
ay, 16 Oct	ober 202	Firmware upgrade		•••
		Save current changes to NEP59x device		 -

NEP59x								×
File View To	ols Help							
Save CFG to	o file							
Load CFG f	rom file	· · · · · · · · · · · · · · · · · · ·						
Exit								
					• • • • • • • • • •			
		• • • • • • • • • • • • • • • • • • •		 	• • • • • • • • • • •			 •••
	• • • • • • • • • • • • • • • • • • •			 • • • • • • • • • • • • • • • • • • •		• • • • • • • • • • • • • • • • • • •	••••••	 ••••
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				 				•••
• • • • • • • • • • • • • • • • • • •		• • • • • • • • • • • • • • • • • • •	•••••	 •••••	• • • • • • • • •		•••••	 •••
• • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • •				• • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • •	•••
lay, 16 October 2020 1:08	18 PM Use me	enu item <tools> for ea</tools>	diting.					





9.4.4 Exporting (Save out to a file) currently loaded logger configuration to a CFG file.

After completion of the connection stage. The PC configuration software will have all of logger configuration in its memory, So the user may export this configuration as backup.

Please click on "File" and then "Save CFG to File", Then provide your reference file name and press "Save"



Save As			×
← → ∽ ↑ 🔜 > This PC > Desktop >	✓ [™] Search E)esktop	o
Organize 👻 New folder			?
A Name	Date modified	Туре	
A Quick access	4/4/2020 9:05 PM	Shortcut	
E Desktop 🖈	9/6/2019 11:52 PM	Shortcut	
- Downloads	3/14/2018 2:28 AM	Shortcut	
🖆 Documents 🖈	8/9/2020 10:52 AM	File folder	
📄 Pictures 🛛 🖈	7/23/2020 5:15 AM	File folder	
📑 BOM compace	4/4/2020 9:20 PM	File folder	
OneDrive	2/21/2020 12:36 PM	File folder	
V K	2/13/2020 9:35 PM	51 A 11	>
File name: new CFG file name			~
Save as type: NEP595 configuration file (*.cfg)			~
∧ Hide Folders	2	ve Cancel	I





9.4.5 Importing a pre-configured logger configuration to software from a CFG file.

After completion of the connection stage, user may apply preconfigured logger setting from a file.

This procedure is involved in two stages,

- 1. Importing of CFG file form your local computer to the Logger software.
- 2. Save the newly loaded CFG file to the attached NEP59x device.

Importing of CFG file form your local computer to the Logger software.



Save the newly loaded CFG file to the attached NEP59x device.







9.4.6 Altering the logger name and reading its serial number.

NEP59x device allows use to provide a unique name to each NEP59x device so that this unique name can appears in user data files. This way user will always know the origin of the data.

Controls are located at "Tools" > "Logger name and serial number"



Type the desired name and press "Set" and close the window by pressing "Close" buttion.

Logger name and serial r	number		- • ×
Serial number:	???????????????????????????????????????		2 •
Logger name:	NEP595 logger #β		Set
	1	3 ⊑>	Close

Save the newly configured data to the attached logger. Note that save to device part can be done at a later stage. e.g. Completion of all configurations.

NEP39x	4		NEP59x -		
File View	Tools	Help	File View Tools Help		
Сомз	1	Getting started wizard(New Setup only)	COM3 DECONNECT S - Home		
		Logger name and serial number	In their starting on part of a ULL format Autorestit		
	EOG	Configure data log	Setting up parameter @location #20 para name WipeStatus successful		
	S	Live data test	-151/ubidiy Sitting up parameter @location #21 para name Turbidiy "gaccassful 2/21/ampentine		×
	Z	SDI12 Measurement sequence	Setting up parameter @location #22 para name Temperature		
	Û	Battery info	etting up SO12 equ #0		Device is restarting Please wait 5 seconds
		System time	section and a setting up SD12 seq #0 power port 1 section and a setting up SD12 seq #0 power port 1		
	""	Configure Telemetry	Secting up SOI12 seq #0 CMD1 0M11 sections and the section of the		ОК
Friday, 16 October 200	٦	Firmware upgrade	- Setting up 501/2 set g0 A001 delay10000 • uccossiti enting up 501/2 set all A002 dollar • Setting up 501/2 set all A002 dollar	1:27:11	I PM
		Save current changes to NEP59x device	Friday, 16 October 2020 125:30 PM 25% Writing edited or new configuration to NEP9% device, Please wait		





9.4.7 Changing the log file settings in SD cards and enable or disable of number of SD cards in use.

P NEP59 Controls are located at "Tools" > "Configure data log" File View Hel Tools СОМЗ Getting started wizard(New Setup only) ۲Ż. Logger name and serial number Configure data log Live data test - - -Configure data log Logging info SD card #2 active SD card #1 active Set By activating both SD cards, the logger will write data to both cards providing increas Disable (un tick) SD cards when not been used. ed data redundance 1800 Seconds(not including measure time) Logging interval Set 5 Log file length \sim Number of lines in file Time stamp in data file UTC \sim Close

The "**Logging Interval**" – This sets the logging interval of the measurement. The logger will wakeup at this interval and carry out the SDi12 sequence you set in the "SDi12 measurement sequence"

The "**Log file length**" – This control sets the limit of data line in each log file. When this limit is reached, then the logger will create a new file. It is advisable to keep this smaller as possible, more file provide higher data radiancy.

The "Time Stamp in data file" - Time stamp format.

After completion, press "SET" buttons and then close the window by clicking close.

Save the newly configured data to the attached logger. Note that save to device part can be done at a later stage. e.g. Completion of all configurations.







Tools Help

Getting started wizard(New Setup only)

9.4.8 Reading the current battery information.

Controls are located at "Tools" > "Battery info"

Battery info	2		Logger name and serial number Configure data log Live data test
16 .1 Fully charg	19V ed voltage is 16.8V and Low cutoff voltage 10.4V.	Read	SDI12 Measurement sequence Battery info System time
Calibration of Offset Multiplier	0 1	Set	
		Close	

User may apply calibration if required.





9.4.9 Reading or Setting the logger internal clock.

Controls are located at "Tools" > "system time"		Note Getting started wizard(New Setup only) Logger name and serial number Configure data log Live data test SD(12 Measurement sequence Battery info System time
P Logger time		
	elect T 2:36	
Current system Time 2020 10 16 14 2 46 Year Month Day Hour Minutes Seconds		
		Close

The **"Current time in NEP59x"** – This shows the current time in the logger. Time display here can be update by pressing the "Read current time" Button.

The **"Synchronize time"** – This allows user to set the logger time and date. Please desired date and time and press "SET" button.

The "Current system time" – this shows the current time in your PC.





Getting started wizard(New Setup only)

Logger name and serial number

Configure data log

Live data test

Tools Help

1

Ď

ित्या द्व

9.4.10 SDI12 measurement sequence.

This section allows user to change the SDI12 sequence that controls the sensors and manage parameters.

Controls are located at "Tools" > "SDI12 measurement sequence"

		A	SDI12 Measurement sequence
SDI12 Measurement sequence		7	Battery info
NEP59x_SDI12	SDI12_CMD_sequence_#1		battery mito
□	This is the SDI12 measurement sequences. The NEP59x logger has 8 of these sequences. Use may populate these sequences or keep them as empty to ignore. Each SDi12 sequence consist of ensors powerup stage, sensor warm-up stage followed by two SDi12		System time
(x) Parameters	command stages and eight received data decode stages. Please expands each sequence tree to access above stages.	(i-))	Configure Telemetry
$-\pi$ Constants			
Image: Bold Sequence #1			Firmware upgrade
■ ↓ = SDI12 CMD sequence #2	×	□ ⇒ 59x	Save current changes to NEP59x devic
⊪— ↓= SDI12 CMD sequence #3	Арріу		
■ SDI12 CMD sequence #4			
⊪—↓= SDI12 CMD sequence #5			
⊪— ↓= SDI12 CMD sequence #6			
$\Box = \int \Xi$ SDI12 CMD sequence #7			
$\blacksquare - \downarrow =$ SDI12 CMD sequence #8			

More information regarding how to configure will be explained with our sensor application notes.

After completing alterations in this window, the user must press

Save the newly configured data to the attached logger. Note that save to device part can be done at a later stage. e.g. Completion of all configurations.



	×
	Device is restarting Please wait 5 seconds
	ОК
1:27:11	1 PM





			setting in F	Cantine.		NEP59x File View	Tools	Help	
C	ontrols are	located at "To	ools" > "Live	data test"		сомз		Getting started wizard(New Set	up onl
0							1.57	Logger name and serial number	
e_Dat								Logger name and serial number	r
	2 Sequenc	æ #1 🗸 🔗		TerminalViev	_			Configure data log	
ID	Param	neter Value	Sequence ID U	lpdated time				Live data test 🛛	$\langle \langle$
	name						Z	SDI12 Measurement sequence	
							8	Battery info	
				Clear		, <u> </u>			
	imple selec	ct the desired	SDI12 seque	ence SDI-1	2 Sequer	ice #1	wish	to test and press	
R		ct the desired	SDI12 seque	SDI-1				to test and press	
R	ve_Data	ct the desired		ence SDI-1		TerminalView Sensor - 5			
R	un 💽		~ (ence	5	^{TeminalView} sensor - 5 Parameter's na	wish	mperature	
R	un 🐼 ve_Data DI-12 Se	quence #3	Value	Sequence ID	Updated time	TerminalView Sensor - 5	wish me - Te ue(final	mperature) - 26.130000	
R	ve_Data DI-12 Se ID 0	quence #3 Parameter name WipeStatus	Value 0.000000	Sequence ID 1:	Updated time 2:33:27 PM 2:24:05 PM	^{TeminalView} sensor - 5 Parameter's na Parameter's val Adjustment - m Adjustment - of	wish me - Te lue(final ultiplier fset - 0	mperature) - 26.130000 - 1.00000 .000000	
R	un ve_Data DI-12 Se ID 0 1	Quence #3 Parameter Name WipeStatus Turbidity	Value 0.000000 6404.200000	Sequence ID 1: 2;	Updated time 2:33:27 PM 2:34:05 PM	TeminalView sensor - 5 Parameter's na Parameter's val Adjustment - m Adjustment - of >>2020-16-10	wish me - Te lue(final ultiplier fset - 0 12:12:4	mperature) - 26.130000 - 1.00000 .000000 7	
R	ve_Data DI-12 Se ID 0	quence #3 Parameter name WipeStatus	Value 0.000000	Sequence ID 1:	Updated time 2:33:27 PM 2:34:05 PM	^{TeminalView} sensor - 5 Parameter's na Parameter's val Adjustment - m Adjustment - of	wish me - Te lue(final ultiplier fset - 0 12:12:4	mperature) - 26.130000 - 1.00000 .000000 7	
R	un ve_Data DI-12 Se ID 0 1	Quence #3 Parameter Name WipeStatus Turbidity	Value 0.000000 6404.200000	Sequence ID 1: 2;	Updated time 2:33:27 PM 2:34:05 PM 2:34:10 PM	TeminalView sensor - 5 Parameter's na Parameter's val Adjustment - m Adjustment - of >>2020-16-10 >>end_of_SDI 	wish me - Te lue(final ultiplier ifset - 0 12:12:4 -12_se	mperature) - 26.130000 - 1.000000 .000000 7 quence_3	
R	un ve_Data DI-12 Se ID 0 1	Quence #3 Parameter Name WipeStatus Turbidity	Value 0.000000 6404.200000	Sequence ID 1: 2;	Updated time 2:33:27 PM 2:34:05 PM 2:34:10 PM	TeminalView sensor - 5 Parameter's na Parameter's val Adjustment - m Adjustment - of >>2020-16-10 >>end_of_SDI >>aOk, User_Table,Ind	wish me - Te lue(final ultiplier ifset - 0 12:12:4 -12_se	mperature) - 26.130000 - 1.00000 .000000 7	
R	un ve_Data DI-12 Se ID 0 1	Quence #3 Parameter Name WipeStatus Turbidity	Value 0.000000 6404.200000	Sequence ID 1: 2;	Updated time 2:33:27 PM 2:34:05 PM 2:34:10 PM	TeminalView sensor - 5 Parameter's na Parameter's val Adjustment - m Adjustment - of >>2020-16-10 >>2020-16-10 >>end_of_SDI 	wish me - Te lue(final ultiplier fset - 0 12:12:4 I-12_se lex,Para	mperature) - 26.130000 - 1.000000 .000000 7 quence_3 Name,Value,St	
R	un ve_Data DI-12 Se ID 0 1	Quence #3 Parameter Name WipeStatus Turbidity	Value 0.000000 6404.200000	Sequence ID 1: 2;	Updated time 2:33:27 PM 2:34:05 PM 2:34:10 PM	TerminalView sensor - 5 Parameter's val Adjustment - m Adjustment - of >>2020-16-10 >>end_of_SDI >>end_of_SDI >aOk, User_Table,Ind atus, User_Table,0,V	wish me - Te lue(final ultiplier fset - 0 12:12:4 I-12_se lex,Para	mperature) - 26.130000 - 1.000000 .000000 7 quence_3 Name,Value,St	
R	un ve_Data DI-12 Se ID 0 1	Quence #3 Parameter Name WipeStatus Turbidity	Value 0.000000 6404.200000	Sequence ID 1: 2;	Updated time 2:33:27 PM 2:34:05 PM 2:34:10 PM	TerminalView sensor - 5 Parameter's val Adjustment - m Adjustment - of >>2020-16-10 >>end_of_SDI >>end_of_SDI >aOk, User_Table,Ind atus, User_Table,0,V 0.000000,1,1;	wish me - Te lue(final ultiplier fset - 0 12:12:4 I-12_se lex,Para	mperature) - 26.130000 - 1.000000 .000000 7 quence_3 Name,Value,St tus	
R	un ve_Data DI-12 Se ID 0 1	Quence #3 Parameter Name WipeStatus Turbidity	Value 0.000000 6404.200000	Sequence ID 1: 2;	Updated time 2:33:27 PM 2:34:05 PM 2:34:10 PM	TerminalView sensor - 5 Parameter's val Adjustment - m Adjustment - of >>2020-16-10 >>end_of_SDI >>end_of_SDI >aOk, User_Table,Ind atus, User_Table,0,V	wish me - Te lue(final ultiplier fset - 0 12:12:4 I-12_se lex,Para lex,Para	mperature) - 26.130000 - 1.000000 .000000 7 quence_3 Name,Value,St tus	
R	un ve_Data DI-12 Se ID 0 1	Quence #3 Parameter Name WipeStatus Turbidity	Value 0.000000 6404.200000	Sequence ID 1: 2;	Updated time 2:33:27 PM 2:34:05 PM 2:34:10 PM	TerminalView sensor - 5 Parameter's na Parameter's val Adjustment - of >>2020-16-10 >>end_of_SDI >>end_of_SDI >>end_of_SDI atus, User_Table,Ind atus, User_Table,0,V 0.000000,1,1; User_Table,1,T 6404.200000,	wish me - Te lue(final ultiplier fset - 0 12:12:4 -12_se lex,Para lex,Para VipeSta urbidity I,2; empera	mperature) - 26.130000 - 1.000000 7 quence_3 	
R	un ve_Data DI-12 Se ID 0 1	Quence #3 Parameter Name WipeStatus Turbidity	Value 0.000000 6404.200000	Sequence ID 1: 2;	Updated time 2:33:27 PM 2:34:05 PM 2:34:10 PM	TerminalView sensor - 5 Parameter's na Parameter's val Adjustment - of >>2020-16-10 >>end_of_SDI >>end_of_SDI >>end_of_SDI >aOk, User_Table,Ind atus, User_Table,0,V 0.000000,1,1; User_Table,1,T 6404.200000, User_Table,2,T 26.130000,0,3	wish me - Te lue(final ultiplier fset - 0 12:12:4 -12_se lex,Para lex,Para vipeSta furbidity I,2; empera ;	mperature) - 26.130000 - 1.000000 7 quence_3 	
R	un ve_Data DI-12 Se ID 0 1	Quence #3 Parameter Name WipeStatus Turbidity	Value 0.000000 6404.200000	Sequence ID 1: 2;	Updated time 2:33:27 PM 2:34:05 PM 2:34:10 PM	TerminalView sensor - 5 Parameter's na Parameter's val Adjustment - of >>2020-16-10 >>end_of_SDI >>end_of_SDI >>end_of_SDI atus, User_Table,Ind atus, User_Table,0,V 0.000000,1,1; User_Table,1,T 6404.200000,	wish me - Te lue(final ultiplier fset - 0 12:12:4 -12_se lex,Para lex,Para vipeSta furbidity I,2; empera ;	mperature) - 26.130000 - 1.000000 7 quence_3 	

Note that the newly red values of each parameters are displayed in the table.





9.4.12 firmware updating procedure.

The tool will be available for this location http://download.observator.com/files/?dir=Software/NEP59x/Windows%20configuration%20tool"

All available firmware will be available in this location http://download.observator.com/files/?dir=Software/NEP59x/NEP59x%20-%20Firmware

The following instruction are designed to guide users on how to update NEP-595 software using the Flash Loader Demonstrator application and the new software available from the Analite website.

- 1. Download the updated NEP-595 software (*.hex) file from the Analite website.
- 2. Download the "Flash Loader Demonstrator" application software from <u>ST website</u> and install it onto your Windows computer.
- 3. Turn off NEP-595 power switch.
- 1. Connect NEP-595 to your PC using the Micro USB cable.
- 2. Go to your computer device manager and find the correct COM port.









3. Press and hold the "Boot" button (also named "reset" in older versions) with a screw driver (or equivalent tool). While holding the "boot" button, turn on the power switch at the same time. After turning on, the button can be released (hold at least for 2 seconds).





4. Run Flash Loader Demonstrator application (the software previously installed in step 2).

onnection. Common for a	nmunication po all families	irt and sel	settings, then	click next to o	pen
UART Port Name	СОМ2	•	Parity	Even	•
Baud Rate	115200	-	Echo	Disabled	-
Data Bits	8		Timeout(s)	10	•

Figure 9.H: Run the Flash Loader Demonstrator

5. Select correct COM port in port name list (according to step 5) and click "Next".

Flash Loade	r Demonstra	itor		 x
	4		ugmented	
Select the cor connection. Common for a Out UART Port Name Baud Rate Data Bits		➡ Pari Ech	·	
	Back	Next	Cancel	Close

Figure 9.I: Select the correct COM port





6. If the bellow screen appeared it means connection is successful, click "Next".

Flash Loader Demonstr	ator		
4	T life.ou	igmented	
Target is readable.	Please click "Nex	it" to proceed.	
		Remo	ve protection
Back	Next	Cancel	Close

Figure 9.J: Connection is successful

7. Wait a few seconds for the application to recognise the device and click "Next".

	A	life.augn	nented	
Please, selec	t your device in the	e target list		
Target	STM32L4x_6_102	24K		•
PID (h)	0415			
BID (h)	9.2			
Version	3.1			
Flash mapping	1			
Name	Start address	End address	Size	
🏇 Page0	0x 8000000	0x 80007FF	0x800 (2K)	
SPage1	0x 8000800	0x 8000FFF	0x800 (2K)	
Nage2	0x 8001000	0x 80017FF	0x800 (2K)	
🂊 Page3	0x 8001800	0x 8001FFF	0x800 (2K)	
SPage4	0x 8002000	0x 80027FF	0x800 (2K)	
💊 Page5	0x 8002800	0x 8002FFF	0x800 (2K)	
💊 Page6	0x 8003000	0x 80037FF	0x800 (2K)	
💊 Page7	0x 8003800	0x 8003FFF	0x800 (2K)	
🂊 Page8	0x 8004000	0x 80047FF	0x800 (2K)	
🏇 Page9	0x 8004800	0x 8004FFF	0x800 (2K)	
SPage10	0x 8005000	0x 80057FF	0x800 (2K)	
🔦 Page11	0x 8005800	0x 8005FFF	0x800 (2K)	-

Figure 9.K: Click "Next"





8. Select "Download to device" and click on the "open button" to address the ".hex" file.

		life.aug	mented	
C	Erase			
	G All	C Selec	tion]
•	Download to device			
	Erase necessary	y pages 🛛 C No E	rase C Glo	bal Erase
	 (h) 8000000 □ Optimize (Removing) 		Jump to the use Verify after dow	
			, eng anor som	
C.	Upload to file			
	D Apply option byte Upload from device			
c	D Apply option byte Upload from device	es	DTECTION 🖃	

Figure 9.L: Select "Download to device"

9. Change (*.s19) files to (*.hex) file, in file type section.

> Open					x
🕒 🗢 📕 🕨 Computer 🕨 I	RamDisk (A:) 🕨 Firm	wareUpdate		Search FirmwareUpdate	۶
Organize 👻 New folder					0
Computer RamDisk (A:) Sol (C:) Cocal Disk (D:) RECOVERY (E:) Service (b:) Cocal Disk (D:) Cocal Disk	E	No items match your s	earch.	Select a file to preview.	
File name:	*.s19		•	19 Files (*.s19) Open Cancel	•

Figure 9.M: Enable (*.hex) visibility





10. You can now select the right file and click open.

Irganize 🔻 New folder			• -
Computer RamDisk (A:) Cost C:) Cost Disk (D:) RECOVERY (E:) Service (I:) Cost Disk (D:) Cost Disk (D:) Cost Cost Disk (D:) Cost Cost Disk (D:) Cost Disk (D:	E	OBS-NEP595-140 52020-V1.007.hex	Select a file to preview.
File name:			▼ hex Files (*.hex)

Figure 9.N: Select (*.hex) file

11.Click "Next".

Erase All C Selection Download to device Download from file A:\FirmwareUpdate\OBS-NEP595-14052020-V1.007.hex Frase necessary pages No Erase Global Erase (h) 8000000 Jump to the user program Optimize (Remove some FFs) Verify after download Apply option bytes Upload from device Upload to file DISABLE WRITE PROTECTION		-7/	life.augme	nted	
Download to device Download from file A:\FirmwareUpdate\OBS-NEP595-14052020-V1.007.hex Erase necessary pages No Erase Global Erase @ (h) 8000000	C Erase				
Download from file A:\FirmwareUpdate\OBS-NEP595-14052020-V1.007.hex Erase necessary pages No Erase Global Erase (h) 8000000 Jump to the user program Optimize (Remove some FFs) Verify after download Apply option bytes Upload from device	6 All		C Selection	r	
Erase necessary pages No Erase Global Erase (h) 8000000 Jump to the user program Optimize (Remove some FFs) Verify after download Apply option bytes Jump to the user program Upload from device Upload to file		551625			
@ (h) 8000000 Jump to the user program Optimize (Remove some FFs) Upload from device Upload to file	A:\Firmwar	eUpdate\0BS-NE	P595-14052020)-V1.007.hex	
Optimize (Remove some FFs) Verify after download Apply option bytes Upload from device Upload to file	Frase r	necessary pages	C No Eras	e C Glot	oal Erase
Upload from device Upload to file	🗖 Optimiz	e (Remove some I			
		s s o			
DISABLE VRITE PROTECTION V					
	Upload to f				

Figure 9.O: Select "Next"





12. Wait a few seconds for the updating process to finish.

Target	STM32L4x_6_1024K
Map file	STM32L4x_6_1024K.STmap
Operation	DOWNLOAD
Sector and the sector of the s	A:\FirmwareUpdate\OBS-NEP595-14052020-V1.007.hex
File size	44.77 KB (45848 bytes)
Status Time	27.28 KB (27938 bytes) of 44.77 KB (45848 bytes) 00:11
	Downloading data 61%

Figure 9.P: Updating in progress

13. When the software is fully updated, the following window will appear.



Figure 9.Q: Software has been updated





- 14. NEP-595 logger is now updated.
- 15. Click close and turn off the power switch.
- 16. Disconnect USB cable from computer.
- 17. Close NEP-595 protective cap.

© Copyright – Observator Group

Since 1924 Observator has evolved to be a trend-setting developer and supplier in a wide variety of industries. Originating from the Netherlands, Observator has grown into an internationally oriented company with a worldwide distribution network and offices in Australia, Germany, the Netherlands, Singapore and the United Kingdom.