Hydrant Pressure Monitoring

Five of the most popular uses of Telog's HPR-31, hydrant pressure recorder, are:
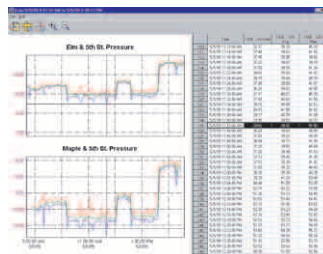
Customer Pressure Complaint

Hydrant Capacity

Fire Flow Testing

Calibrate Hydraulic Models

C-factor Testing

Everything You Need is Included in These Two Convenient Kits

APPLICATION

Customer Pressure Complaint

BENEFITS

- **One person can do it all**
- **More accurate and reliable than chart recorders**
- **No exposed electronics — collect data in the rain**
- **Electronically documented test results**
- **Easy to use kits available**

OVERVIEW

One of the most popular uses for the Telog Hydrant Pressure Recorders (HPRs) is to monitor and analyze customer pressure complaints. The HPR is ideally suited for this application because it is rugged, highly portable and can give a complete, time stamped picture of the pressure differential between the customer's water pressure and the water pressure being delivered by the local utility.

Everything you need to investigate customer pressure complaints is available in this kit with a durable carrying case.

Attach an HPR to the hydrant that is closest to the customer's building and on the same main.

Attach a second HPR to the customer's water line. This can be done using a garden hose and an HPR with Telog's garden hose adapter. Fill the hose with water and attach the HPR. Once the HPR is securely attached, completely open the customer's spigot.

Customer's House

Customer Residence (PSI)

Water Authority Main (PSI)

Pressure Differential
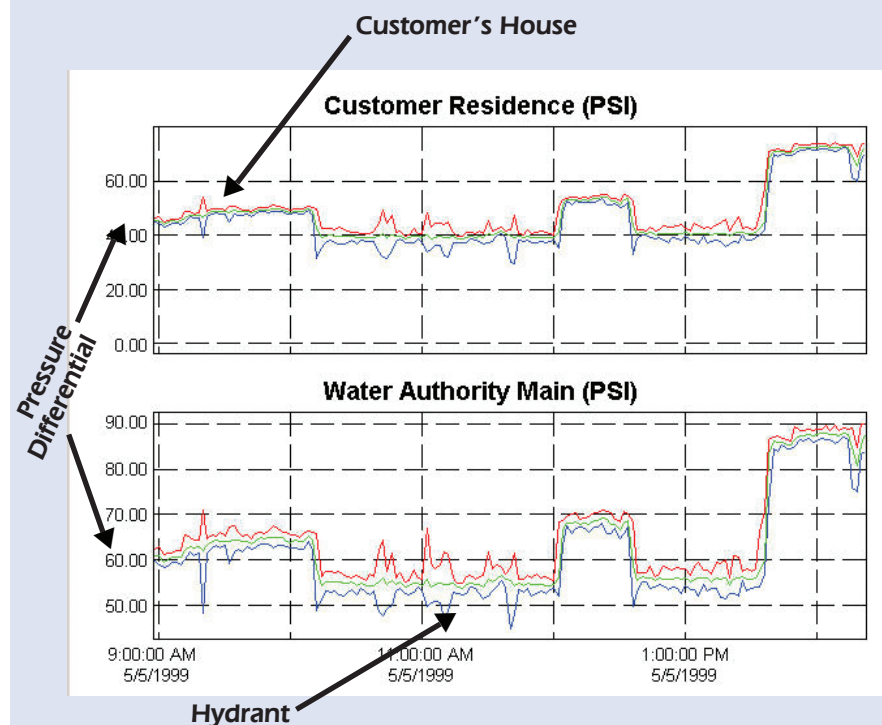
Data may be collected and viewed on-the-spot or back in your office. Once the data has been collected from both HPRs, it can be easily graphed in Telogers software.

In the example to the left, it is clear that there is approximately a 20 psi difference between the pressure at the customer's house and the water pressure being supplied by the water utility.

A graph of the data can be shown to the customer so that they clearly see the pressure differential and that the utility has more than adequate water pressure in the main.

Hydrant

APPLICATION

Fire Flow Testing

BENEFITS

- **One person can do it all**
- **Based on NFPA 14 and the AWWA M17 guidelines**
- **More accurate & reliable method than pitot gauges**
- **No exposed electronics — perform test in the rain**
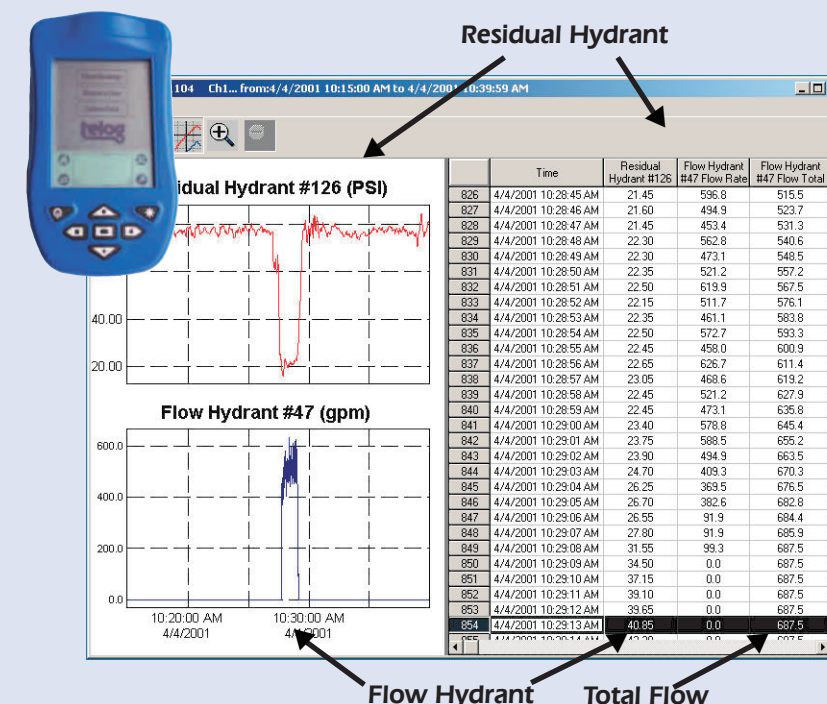
OVERVIEW

Using Telog's HPR-31 units for fire flow testing provides you with more accurate information than conventional, manual methods of testing. Because the HPR is always recording and time stamping data, the testing can be performed and completed by one person. The testing procedure is based on guidelines in the NFPA 14 and the AWWA M17 manuals, so you will be sure to meet regulation requirements.

Everything you need to perform fire flow testing is in Telog's Flow Test Kit II-D.

Attach an HPR unit to the residual hydrant and an HPR unit with diffuser to the flow hydrant. Using your Telog DTU, you will be able to do on-the-spot pressure analysis. All data is stored in the DTU for further viewing and analysis on your PC running Telogers for Windows software.

Residual Hydrant

Residual Hydrant #126 (PSI)

Flow Hydrant #47 (gpm)

Time	Residual Hydrant #126	Flow Hydrant #47 Flow Rate	Flow Hydrant #47 Flow Total
826	4/4/2001 10:28:45 AM	21.45	536.8	515.5
827	4/4/2001 10:28:46 AM	21.60	494.9	523.7
828	4/4/2001 10:28:47 AM	21.45	453.4	531.3
829	4/4/2001 10:28:48 AM	22.30	562.8	540.6
830	4/4/2001 10:28:49 AM	22.30	473.1	548.5
831	4/4/2001 10:28:50 AM	22.35	521.2	557.2
832	4/4/2001 10:28:51 AM	22.50	619.9	567.5
833	4/4/2001 10:28:52 AM	22.15	511.7	576.1
834	4/4/2001 10:28:53 AM	22.35	461.1	583.8
835	4/4/2001 10:28:54 AM	22.50	572.7	593.3
836	4/4/2001 10:28:55 AM	22.45	458.0	600.9
837	4/4/2001 10:28:56 AM	22.65	626.7	611.4
838	4/4/2001 10:28:57 AM	23.05	468.6	619.2
839	4/4/2001 10:28:58 AM	22.45	521.2	627.9
840	4/4/2001 10:28:59 AM	22.45	473.1	635.8
841	4/4/2001 10:29:00 AM	23.40	578.8	645.4
842	4/4/2001 10:29:01 AM	23.75	588.5	655.2
843	4/4/2001 10:29:02 AM	23.90	494.9	663.5
844	4/4/2001 10:29:03 AM	24.70	409.3	670.3
845	4/4/2001 10:29:04 AM	26.25	368.5	676.5
846	4/4/2001 10:29:05 AM	26.70	382.6	682.8
847	4/4/2001 10:29:06 AM	26.55	91.9	684.4
848	4/4/2001 10:29:07 AM	27.80	91.9	685.9
849	4/4/2001 10:29:08 AM	31.55	99.3	687.5
850	4/4/2001 10:29:09 AM	34.55	0.0	687.5
851	4/4/2001 10:29:10 AM	37.15	0.0	687.5
852	4/4/2001 10:29:11 AM	39.10	0.0	687.5
853	4/4/2001 10:29:12 AM	39.65	0.0	687.5
854	4/4/2001 10:29:13 AM	40.85	0.0	687.5

Pressure and flow data may be collected with your Telog DTU and transferred to your computer for viewing and analysis in Telogers for Windows. You can also download data directly from your HPRs to your computer. Both the residual hydrant and the flow hydrant data can be displayed simultaneously in Telogers software. You will be able to view a clear picture of the entire flow test.

The Telog DTU can also display the current pressure or flow data from an HPR.

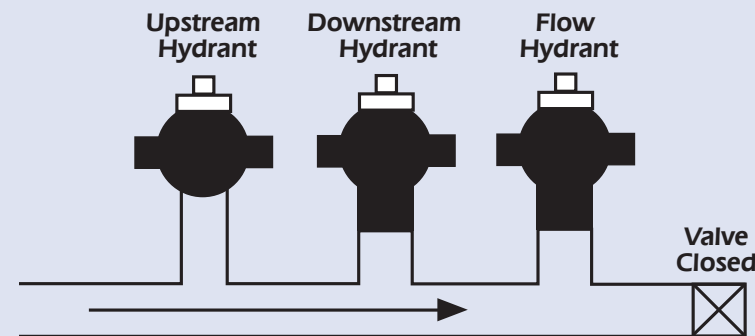### Flow Hydrant   Total Flow

APPLICATION

C-factor Testing

BENEFITS

- **One person can do it all**
- **More accurate and reliable than pitot gauges**
- **No exposed electronics — perform test in the rain**

OVERVIEW

C-factor testing with HPR units will measure discharge and head loss. By using HPRs, a task which normally requires three or more people becomes a one-person job. There is no need to station a person at each hydrant. The HPR automatically records and time stamps the data. This information can then be used to calculate pipe roughness in terms of Hazen-Williams C-factor.

APPLICATION

Add to Your Flushing Program

BENEFITS

- **Hydrant capacity testing**
- **Capture peak flow rate for color coding**
- **Reduce the amount of unaccounted for water**
- **One person can do it all**

OVERVIEW

Numerous water authorities have instituted flushing programs to help maintain the health of their distribution system. In many mains, water moves through at less than two miles per hour. Flushing removes built up sediment that restrict the water. When you use the Telog Hydrant Flow System you can simultaneously accomplish two other important functions — hydrant capacity testing and reduce unaccounted for water.

Upstream Hydrant **Downstream Hydrant** **Flow Hydrant**

Valve Closed

Attach HPRs to the Upstream and Downstream hydrants and close valve(s)

Use your Telog DTU to observe the static pressure at the upstream and downstream hydrants
4.87
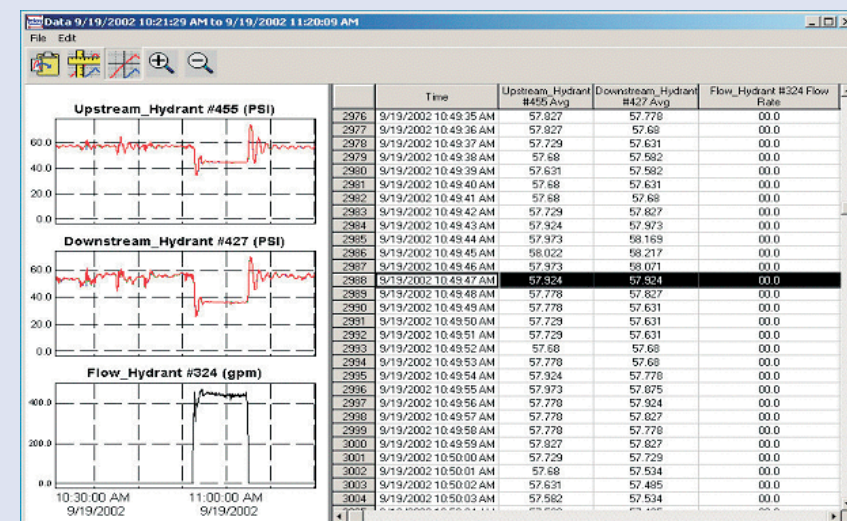
$$C = \left(\frac{C_f L Q^{1.852}}{h_l D^{4.87}} \right)^{1/1.852}$$

Collected data will give you what is needed for C-factor calculations and can be read from a graph such as the one on the left.

Hydrant Capacity Testing
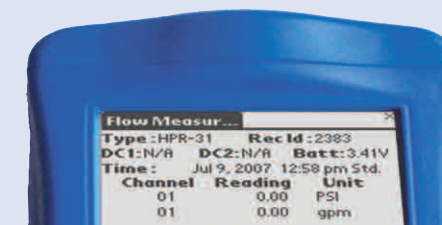
The peak flow rate of the hydrant can be read from your Telog DTU. Using this information, you can determine the appropriate color-coding of the hydrant.

Bonnet and Cap Color-code
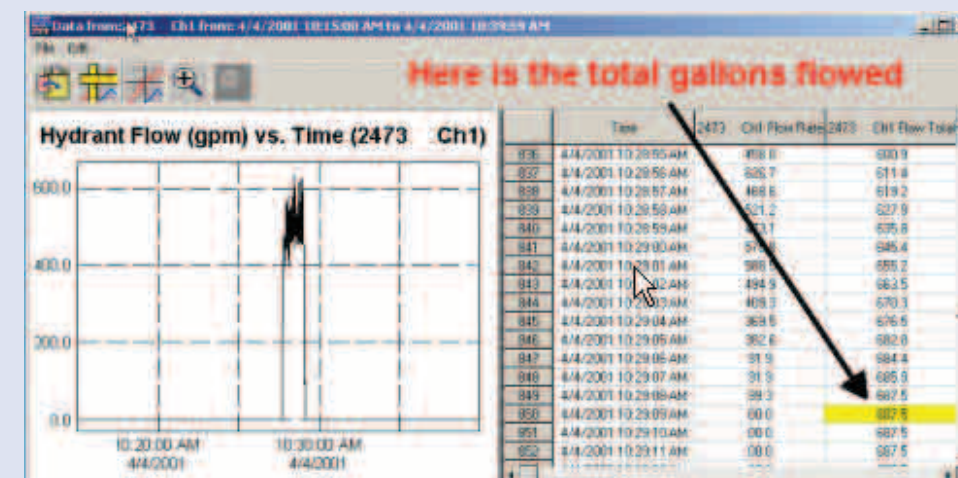**RED** — Less than 500 GPM
ORANGE — 500 to 999 GPM
GREEN — 1000 to 1499 GPM
LIGHT BLUE — 1500 or more GPM

This hydrant flowed less than 500 gpm, therefore, it's caps and bonnet are painted **RED**.

Unaccounted for Water

Here is the total gallons flowed

When you use Telog's Hydrant Flow System to flush your hydrants, the total gallons flowed during a hydrant flush are automatically recorded. This reduces the amount of unaccounted for water in your distribution system.

APPLICATION

Calibrating Hydraulic Models

BENEFITS

Use exported HPR data in your modeling software for:
- **Model calibration data**
- **Steady-state analysis**
- **Extended-period analysis**
- **Data is stamped with time and date**
- **More accurate, reliable and flexible than pitot gauge**

OVERVIEW

Fire flow testing and C-factor testing are two of the most common field tests used for model calibration. Using Telog HPRs can greatly simplify that testing (see Telog's application notes on fire flow & C-factor testing) and the data from Telogers software can be exported to many of today's software modeling packages.
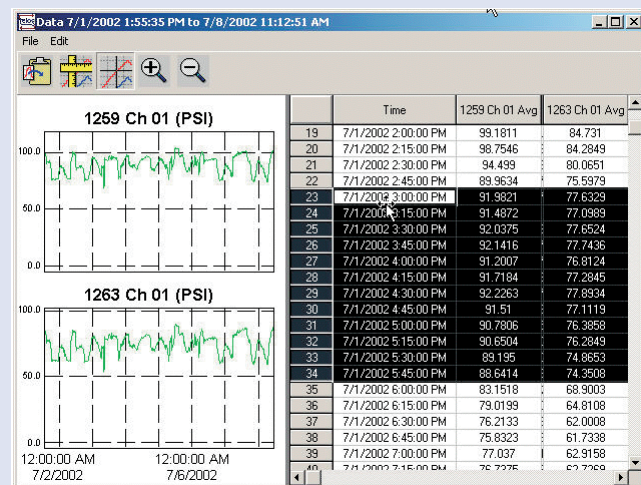
In time series analysis you can study your system over an extended period of time. Fill and drain cycles of tanks, pump and valve response, as well as daily fluctuations in usage, can all be simulated using time-series analysis. The HPR easily collects and exports these data to your modeling software package.

All HPR data are date and time stamped. The combination of HPRs and Telogers software is well suited to collecting, displaying and exporting time-series data. The pressure data in the graph to the left was stored in 1 minute intervals, but for our time-series analysis we wanted 15 minute averages from 3 pm to 6 pm. As you can see, the tabular data is displayed in 15 minute averages and the desired period is highlighted.
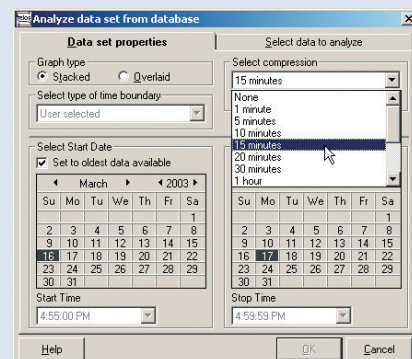
There are several ways to export data from Telogers software. Data can easily be exported to 3rd party software packages such as Microsoft Excel, Microsoft Word, various HMI and Modeling packages.

Telog has an ongoing committment to continuously work with hydraulic modeling software manufacturers to further simplify data transfer between software applications.

Typical Applications Using Telog Recorders

SSO/CSO Event Monitoring

Wireless option

Direct connect option

Wireless communication or direct connect options

Alarm notification

Time stamped events

Record level and duration of events

Inflow & Infiltration Alarm Notification

Recording rainfall

Recording wastewater flow

Host computer

Rain fall data and wastewater flow data are sent to the host computer via wireless communication. Data is correlated at the host computer to provide alarm notification.
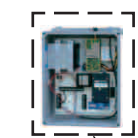
Water Level Recording

Wireless communication or direct connect options

Alarm notification

Time stamped events

Record level and duration of events

Tank Monitoring

RS-33 system monitoring tank level
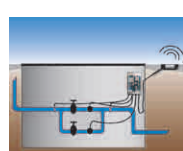
Chemical, fuel, or water level and transaction monitoring

Inventory management

Level alarm notification

Refill scheduling

Wireless and solar power options

PRV Monitoring

Flow

Pressure

Water quality

Wireless communication via buriable antenna

The buriable antenna is used for underground remote data transmission where fixed cellular antennas cannot be used.

Environmental

Rainfall

pH

Windspeed

Temperature

Humidity

Anatomy of HPR-31 Kits

HPR Kit II-D

Heavy Duty Carrying Case

2 HPR-31 Units

Garden Hose Adapter

Telog DTU for Data Transfer

Data Transfer Cables
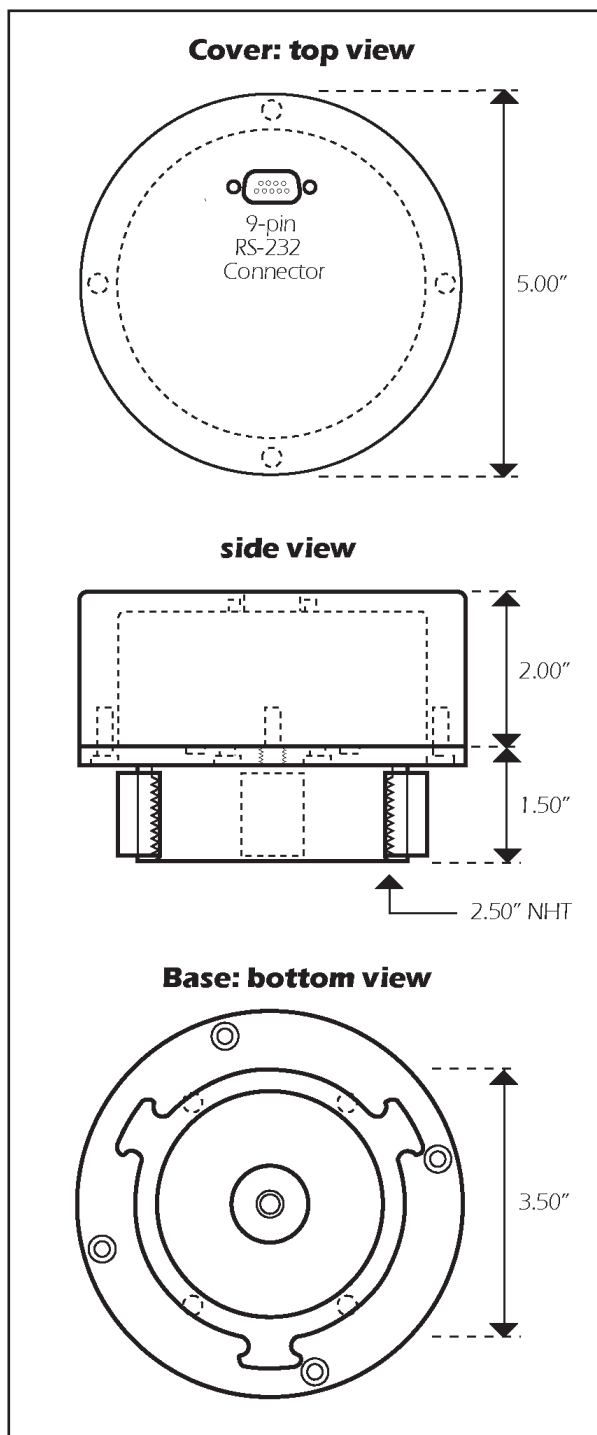
Flow Test Kit II-D

Heavy Duty Carrying Case

2 HPR-31 Units

Telog DTU for Data Transfer

Diffuser

Data Transfer Cables

HPR-31 Specifications

Cover: top view

9-pin
RS-232
Connector

5.00"

side view

2.00"

1.50"

2.50" NHT

Base: bottom view

3.50"

Input

Type	Strain gauge, isolated pressure sensor
Range (psi)	100 200 300
	(contact Telog for other ranges)
Over Pressure (psi)	300 600 600
Burst Pressure (psi)	850 1000 1000
Resolution	0.025% of full scale, 12-bit
Accuracy	±0.25% of full scale
	at constant temperature
Temperature Effect	±0.01% of full scale per °C

Recording

Sample rate	Programmable from 4/sec up to 8 hours
Data interval	Programmable from 1/sec up to 8 hours
Values saved	Selectable min, avg & max per interval
Memory	128 Kbytes (~80,000 data values)

Interface

Type	RS-232; 300 to 19.2 Kbaud
Connector	Circular 4 pin watertight

Battery

Type	Single AA Lithium (Saft LS 14500 or equal)
Life	5 years typical

Environmental and Mechanical

Temperature	
Operating	-10° to 65°
Storage	-40° to 65° C
Humidity	0-100% relative humidity
Enclosure	NEMA 4x /IEC IP65
Size	12.70 cm diameter x 8.89 cm
	(5" diameter x 3.5")
Thread*	Hydrant mount: 2.50" NHT standard,
(see side view)	Contact Telog for non-standard thread
	Internal mount: 1/4 NPT

Support Software

S-3PC	Telogers for Windows
S-3PCL	Telogers for Windows Lite
Telog Model DTU-R	Data Transfer Unit; IP-67 rated PDA running Palm OS
	and Telog application program

Computer Requirements

For S-3 PC or S-3PCL	IBM compatible computer with
	a 586/133 MHz or higher processor
	running on Microsoft Windows 95/98/NT/2000/XP,
	at least 32 MB of RAM, a hard disk with at least
	200 MB of free space and a pointing device.

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