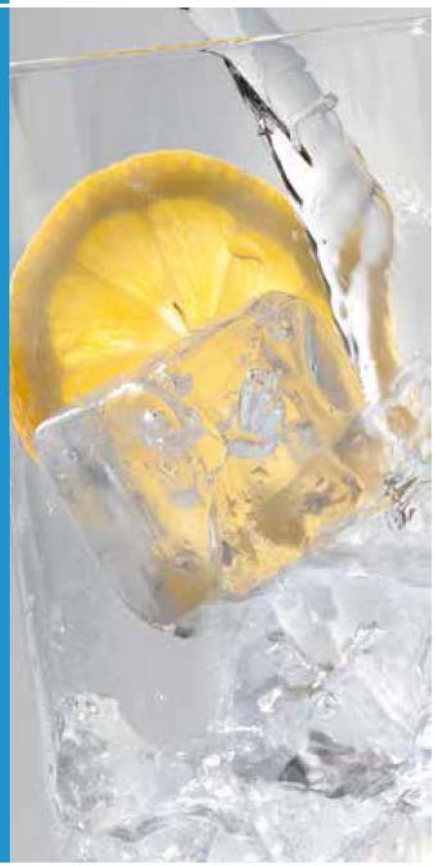
Network Engineering
Industrial Automation

Products Solutions Services

Cleaning in Place (CIP)
Portfolio of Endress+Hauser solutions



Endress+Hauser
People for Process Automation

1 Flow
2 Level
3 Analysis
4 Temperature

Proline Promag H 100 / 50H

Volumetric flow measurement in hygienic applications

Flow meter, initially operating electromagnetically, for two-way measurements of liquids with conductivity over ≥ 5µS/cm:

Tasks

Industries: Dairies, breweries, bottling plants (sparkling and non-sparkling drinks).

- Controlling the mechanical effect of cleaning (Calculation of the system operating speed).
- Calculating the amount of volumetric flow used in hot water.
- Calculating the amount of volumetric flow (water and base) used in the alkaline phase.
- Calculating the amount of volumetric flow (water and acid) used in the acid phase.
- Calculating the amount of volumetric flow used in rinse water.
- Calculating the amount of volumetric flow in the disinfection substance.

Characteristics

- Sanitary authorizations (food and drinks): Authorization 3A, EHEDG certificate, authorization according to FDA, USP Class VI.
- Specific characteristic: PFA liner, up to 150°C.
- Electrical authorizations for classified areas: ATEX, FM, CSA, TIIS.
- Communication with process control systems: HART, Profibus DP/PA, FOUNDATION Fieldbus, Modbus RS485, EtherNet/IP.
- Process conditions:
  - Flow measurement up to 600m3/min (2650gal/min).
  - Temperature of the fluid up to +150°C.
  - Process pressure up to 40bar (580psi)
  - CIP/SIP cleaning.
  - Stainless steel housing.

Customer revenue

The concept of the Proline transmitter comprises:

- Modular and operational device which results in a high level of efficiency and cost-saving in spare parts.
- Concept of uniform handling.
- Advanced software characteristics.

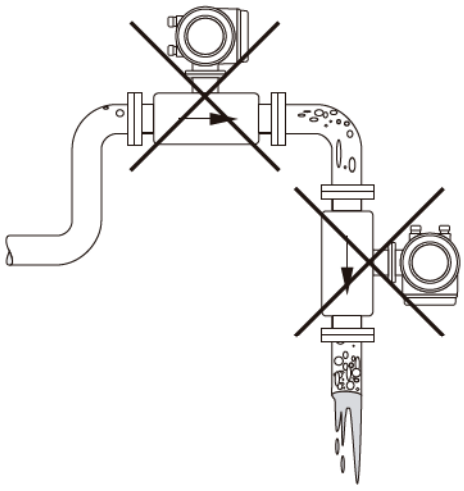
The Promag sensor offers the following properties:

- It does not generate pressure loss.
- It is not sensitive to vibrations.
- It is easy to install and commission.

Installation recommendations

The formation of bubbles of air or gas trapped in the pipe can result in an increase in the measurement errors. Avoid the following places for installing the pipe:

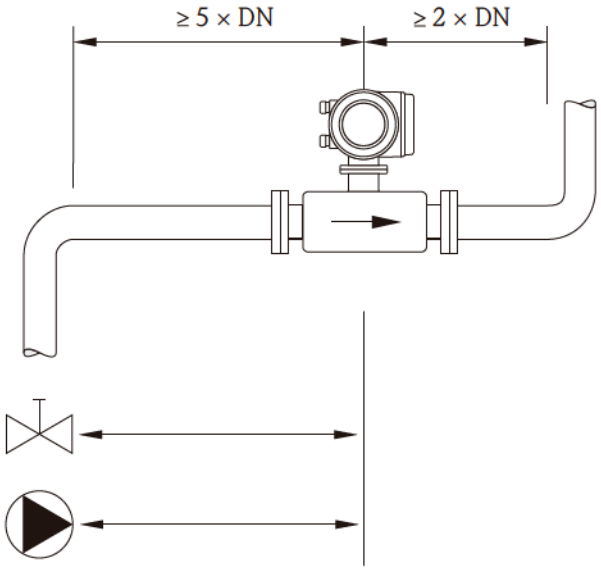
- The highest point of a pipe. Risk of air entrainment.
- Directly upstream of a free outlet in a vertical, descending pipe.

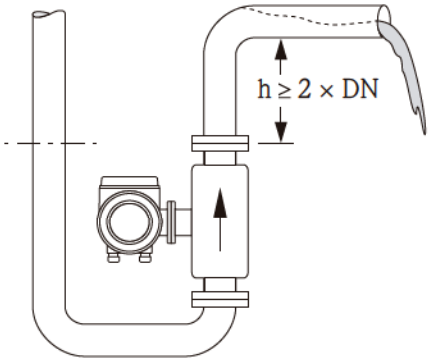


Non-recommended installation

If possible, install the sensor away from valves, T connections, elbows, etc. Take into consideration the following distances before and after the measurer, this will ensure accuracy in the measurement:

- Upstream: > 5 x DN
- Downstream: > 2 x DN





Ideal or desired installation

Liquiphant M, FTL50H

Point level switch for liquids

The instrument operates thanks to the vibration to the intrinsic frequency (resonance) of the sensor fork. When the fork is covered by the liquid (medium), a change in the frequency occurs (reduction), when the sensor detects this change it modifies its outlet status (switches on/ switches off). This reliable function is not affected by external distortions, like bubbles, flow, foam, vibration or a build-up of solids.

Tasks

Industries: Dairies, breweries, bottling plants (sparkling and non-sparkling drinks).

- Pump safeguarding to avoid working under a partial vacuum.
- Alarms in tanks for safeguarding overflow.
- Safeguarding tanks due to low level.
- One-off level.
- Cut in production due to limit levels.
- Process safety.
- Foam detection.
- Detection of build-up.

Characteristics

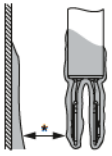
- Sanitary authorizations (food and drinks): Authorization 3A, EHEDG certificate, authorization according to FDA.
- It is not susceptible to external conditions.
- Monitoring the status of the fork (good operation).
- Protocol Profibus PA for commissioning and maintenance.
- Compact, IP69K stainless steel housing (optional), guaranteeing normal operation during cleaning or during immersion over several hours.
- Process conditions:
  - Process temperatures between -50°C and 150°C
  - Pressure up to 100bar
  - Viscosity up to 10,000mm2/s
  - Densities ≥ 0.5g/cm3 or ≥ 0.7g/cm3

Customer revenue

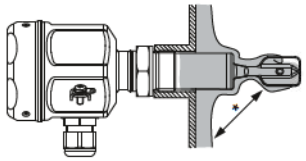
- Flexible: Easy installation and commissioning.
- Maintenance-free.
- Sensor with hygienic connections to be used in pipe and/or tanks.
- Robust design with stainless steel body.

Installation recommendations

With buildup on the tank walls:
* Ensure that there is sufficient distance between the buildup expected on the tank wall and the fork.

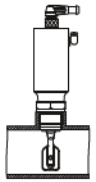


Vertical from above



Protruding into the tank from the side

Mounting in piping from 2"
Flow velocities up to 5 m/s for viscosity 1 mm/s and density 1 g/cm³. (Check the function for other medium conditions.)



Deltapilot S FMB70

Continuous level via hydrostatic pressure measurement

Sensor for level measurement via hydrostatic pressure, Contite technology in the measurement cell.
Condensation resistant which provides great stability during the equipment's service life.

Tasks

Industries: Dairies, breweries, bottling plants (sparkling and non-sparkling drinks).

- Measurements in liquids for level, volume or mass.
- Continuous level measurement in tanks with acid, caustic and water.

Characteristics

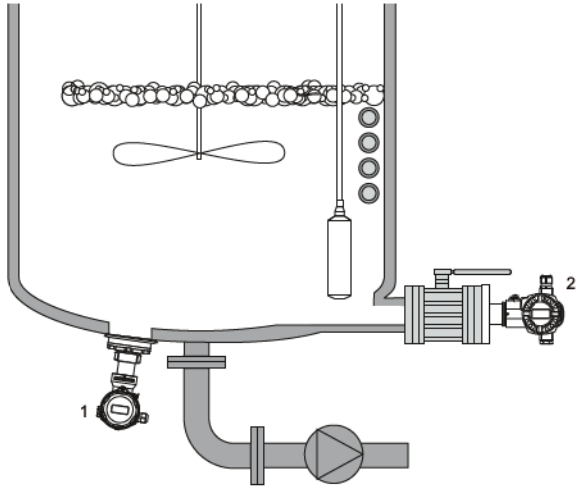
- HistoROM/M-DAT memory module that allows for a backup copy of the device management settings and the measured values.
- Excellent reproducibility and long stability.
- Accuracy up to ±0.075%.

Customer revenue

The pressure element in the CONTITE measurement cell is completely protected between the process diaphragm and the measurement diaphragm.
Thanks to this hermetic seal on the measurement insert, the CONTITE membrane is completely insensitive to the formation of condensation and aggressive gases, which provides reliable measurements and long service life for the equipment.

Installation recommendations

- Install the instrument always under the lowest measurement point (1).
- It is advisable to install a pressure transmitter behind a shut-off valve (2) to facilitate cleaning and correct operation.
- Do not install the instrument in the following positions: The flow of the incoming medium, in the tank outlet or at a point in the tank where there are pressure pulses due to the agitator.



Indumax CLS54D, Smartec S CLD134

Ensuring cleaning via conductivity measurement

Smartec S CLD134 - inductive conductivity measurement sensor - it is specifically focused on being used in hygienic tasks in the food and drink industries.
The requirements of this industry are fulfilled thanks to the design of the body using PEEK material (without seals or cracks) and hygienic certificates. Either in compact- or remote-instrument version, this equipment is available.

Tasks

Industries: dairies, breweries, bottling plants (sparkling and non-sparkling drinks).

- Separation of phases: of medium/water and mixtures in the return channel.
- Control of the concentration of cleaning agents.
- Monitoring the medium in pipes, which ensures its quality.
- Leakage flow monitoring.
- Redirecting the return phase for reusing or draining..

Characteristics

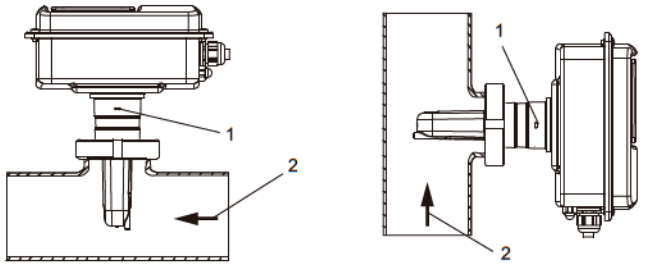
- Sanitary authorizations (food and drinks): Authorization 3A, EHEDG certificate, authorization according to FDA.
- Specific characteristic: Use of un-used PEEK material.
- Communication with process control systems: HART, Profibus DP/PA, FOUNDATION Fieldbus, Modbus RS485, EtherNet/IP.
- Integrated tables of NaOH, HN03, H3P04, H2S04 converting conductivity into concentration.
- Input of manual tables to determine the conductivity equivalents of other cleaning agents with concentration.
- Switch for measurement range.

Customer revenue

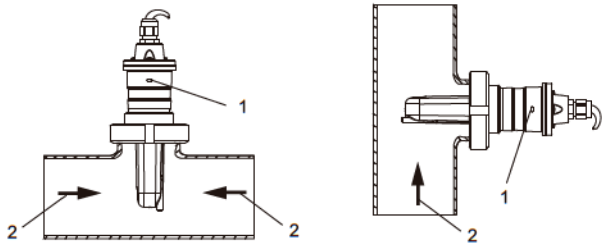
The conductivity measurement in the return line and in the tanks make it possible to calculate the concentration ensuring the whole CIP circuit is at the required concentration level and that the ideal cleaning conditions have been reached. Reducing the use of cleaning agents and optimize the cleaning time reduces the amount of energy needed to hold the CIP circuit at the appropriate temperature. Faster phase shift and using less cleaning agent reduces the amount of water, and this results in energy-saving in water treatment and pollution reduction.

Installation recommendations

Installing the inductive sensor in pipes with horizontal and vertical circulation directions for the medium flow rate. Take into consideration the immersion depth.



1 - Arrow in direction of flow rate circulation
2 - Flow rate direction



Sensor OUSAF11

Identification of trace compounds via absorbency measurements

It is used to determine the amount of VIS (Visible Spectrum)/NIR (Near-Infrared) absorbed in a liquid medium. This way a light source emits radiation through a medium, the transmitted radiation is measured in the side of the detector after passing through a filter (depending on the wave length) and with the help of a photo diode a current output is obtained.

Tasks

Industry: Dairy.

- Separation of phases in the return for media with very similar conductivity (e. g., water/milk).
- Rapid and independent response to the temperature change.
- Drop in loss of medium.
- Cut in media increase: Cream-water; water-cream.
- Energy cost-saving in CIP systems by detecting milk trace elements in the return circuits.
- Quality control by measuring turbidity.

Characteristics

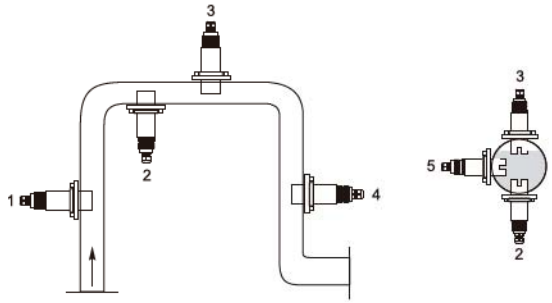
- Communication with process control systems: HART, Profibus DP/PA, FOUNDATION Fieldbus, Modbus RS485, EtherNet/IP.
- Robust design with stainless steel body resistant to pollution with endings made in FEP.
- Operating temperature: 0 to 90°C.
- Independent color measurement with option of NIR detector.

Customer revenue

- Hygienic design without glass guarantees maximum safety in the process.
- Immersible sensor for tasks with open tanks.
- Insertion sensor with hygienic connections: Triclamp or Varivent for being used in pipe and/or tanks.
- Availability of two “optical paths” 5 and 10 min.
- Measurement range: 0 to 3UA (units of absorption).
- Low voltage, incandescent strobe lamp provides long service life and stable operation.

Installation recommendations

- The diameter of the pipe must be at least 50mm (2“).
- Install the sensor in places with uniform flow conditions.
- The best installation location is in the ascending tube (position 1).
- Installation is also possible in the horizontal pipe (position 5).
- Do not install the sensor in places where the air can collect or form bubbles or foam (position 3), or when there are suspended particles (position 2).
- Avoid installing in pipe downwards (position 4).
- Orientate the sensor so that the medium flows through the measurement section, self-cleaning effect.



iTHERM TM411, Easytemp TMR35

RTD for hygienic and aseptic applications

Dedicated to use in hygienic and aseptic applications in the food and drink industries, it offers varied technical innovations: iTHERM QuickSens, StrongSens or QuickNeck. This leads to a considerable reduction in maintenance costs, improving production quality and process efficiency, and offers a high level of safety.

Tasks

- Temperature of sending and return water.
- Temperature of the alkaline sending and return phase (concentration calculation).
- Temperature of the acid sending and return phase (concentration calculation).

Characteristics

- Measurement ranges : -200 to +600°C (-28 to +1112°F).
- Pressure ranges up to 40bar (580psi)
- Grade of safeguarding: up to IP69K.

Customer revenue

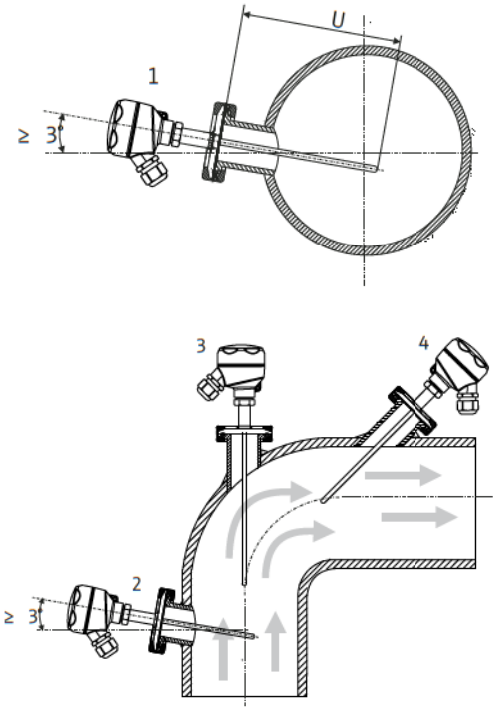
- Reliable and easy to use from equipment selection to maintenance.
- ITHERM QuickSens: best response times (t90s: 1.5 s) for optimum control of processes.
- iTHERM StrongSens: unbeatable vibration resistance (> 60g) for maximum plant safety.
- iTHERM QuickNeck – saves time and costs thanks to its easy, tool-free recalibration.
- International certificates : explosion-proof certificate from ATEX/IECEx, and hygienic standards according to 3A, EHEDG, ASME and FDA.

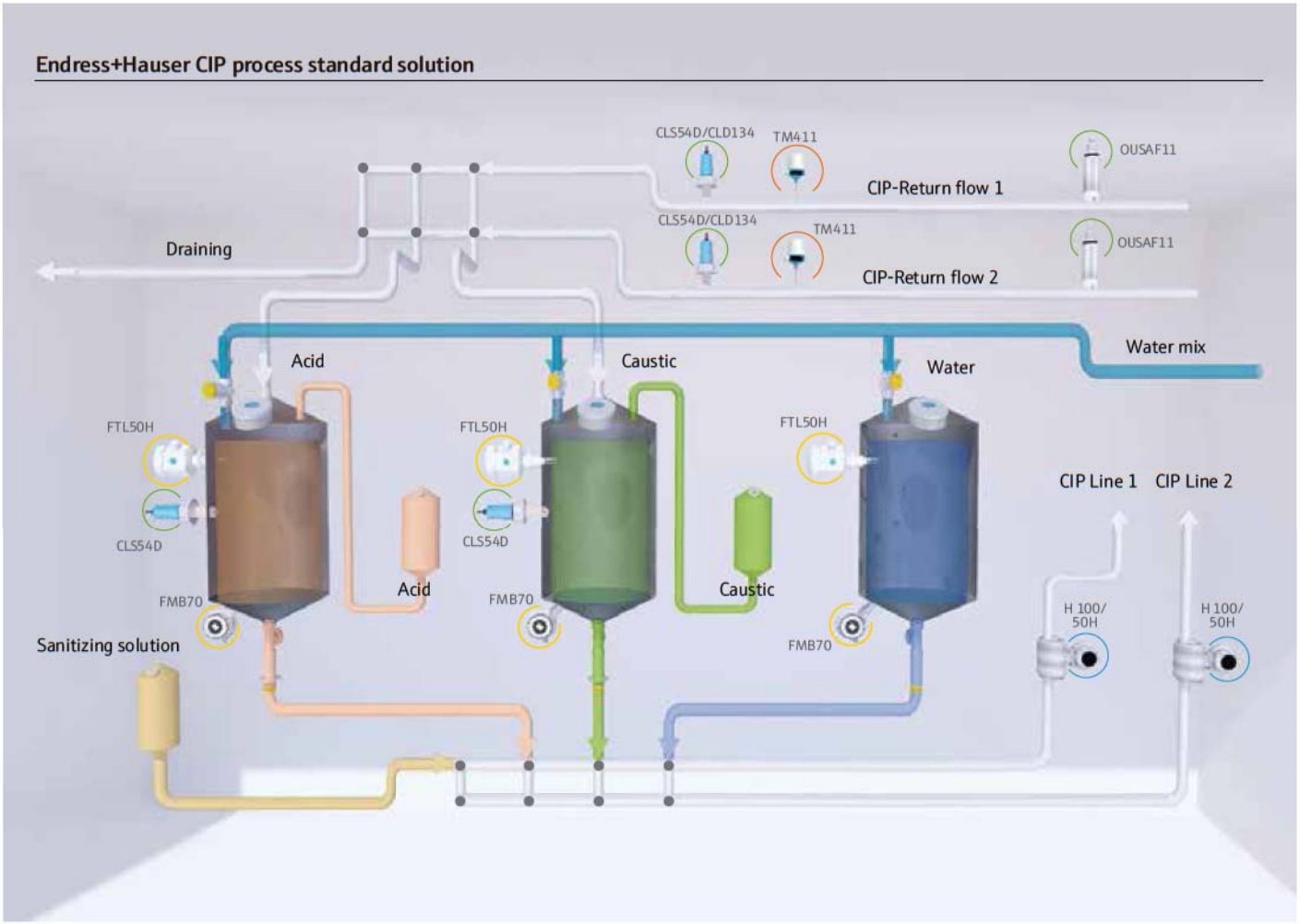
Installation recommendations

The immersion distance of the sensor can affect accuracy. If the immersion distance is very small, any errors in the measurement are due to the transfer of heat by the process connection on the tank wall. If installation is in pipes then the immersion distance must be ideally half the diameter of the pipe.

- Position 1 and 2, perpendicular to the flow direction, installed at a minimum angle of 3° to ensure self-draining.
- Position 3, installation in elbows.
- Position 4, installation tilted in tubes with a small nominal diameter.
- U = immersion length.

The use of the iTHERM QuickNeck insert is advisable for immersion distances of U < 70 mm (2.76inch).





The CIP process, an acronym of Cleaning In Place, consists in removing the pollution deposited on the surfaces of the process equipment and it is an essential operation in food preparation. The main reasons for performing this cleaning are: To satisfy food safety (rules and standards), increase equipment service life and reduce the rate of medium decomposition. Therefore, it is essential that the process equipment suppliers guarantee that the equipment sold can be cleaned under this process. The CIP principle is very simple, as it is only necessary to overcome the forces that joint the pollution to the equipment surface, and this is achieved using mechanical means and/or chemical effects, together with an increase in temperature. A term often used in the cleaning process is the "Zinner circle", which defines the four main variables to be controlled: Temperature, flow, concentration of cleaning agents and time, these parameters are completely dependent on each other.

We understand the most demanding challenges in CIP process

Many food processes continue operating CIP systems with few instruments, based on time measurements and manual checks, this way the long cleaning cycles prolong the plant stops while energy and cleaning agents are lost. If the system runs automatically, this will help detect the changes in the process conditions. Installing instruments on line provides real-time control and follow-up, as well as making the process completely traceable, and this allows fast access to the process data, such as concentration, temperature, speed and phase shift. This way it achieves the maximum washing effect, measures the phase separation, determines when a cycle starts or finishes, and also quantifies water and chemical consumption, which are increasingly more common challenges. If in addition we add the need to have documented proof of your process to comply with the safety auditing recommendations defined in standards (like the metering control standard ISA88/EN 61512), it becomes a real challenge. With the portfolio detailed here – which has instruments designed for the food and drink industry – you will be able to automate and overcome the challenges facing this process.

- Hygienic materials: Using GRAS materials numbered in CFR21 part 175 to 186 and according to EN1935 / 2004.
- Hygienic design 3-A and EHEDG ensuring these are used in cleaning systems.
- Process conditions: Our equipment is available with a variety of different hygienic process connections for satisfying industry needs.

Network Engineering
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Network Engineering
Jbeil, Ghoson Center
P.O.Box 115 Jbeil, Lebanon
Tel: +961 9 636 806
Fax: +961 9 636 142
info@networkenglb.com