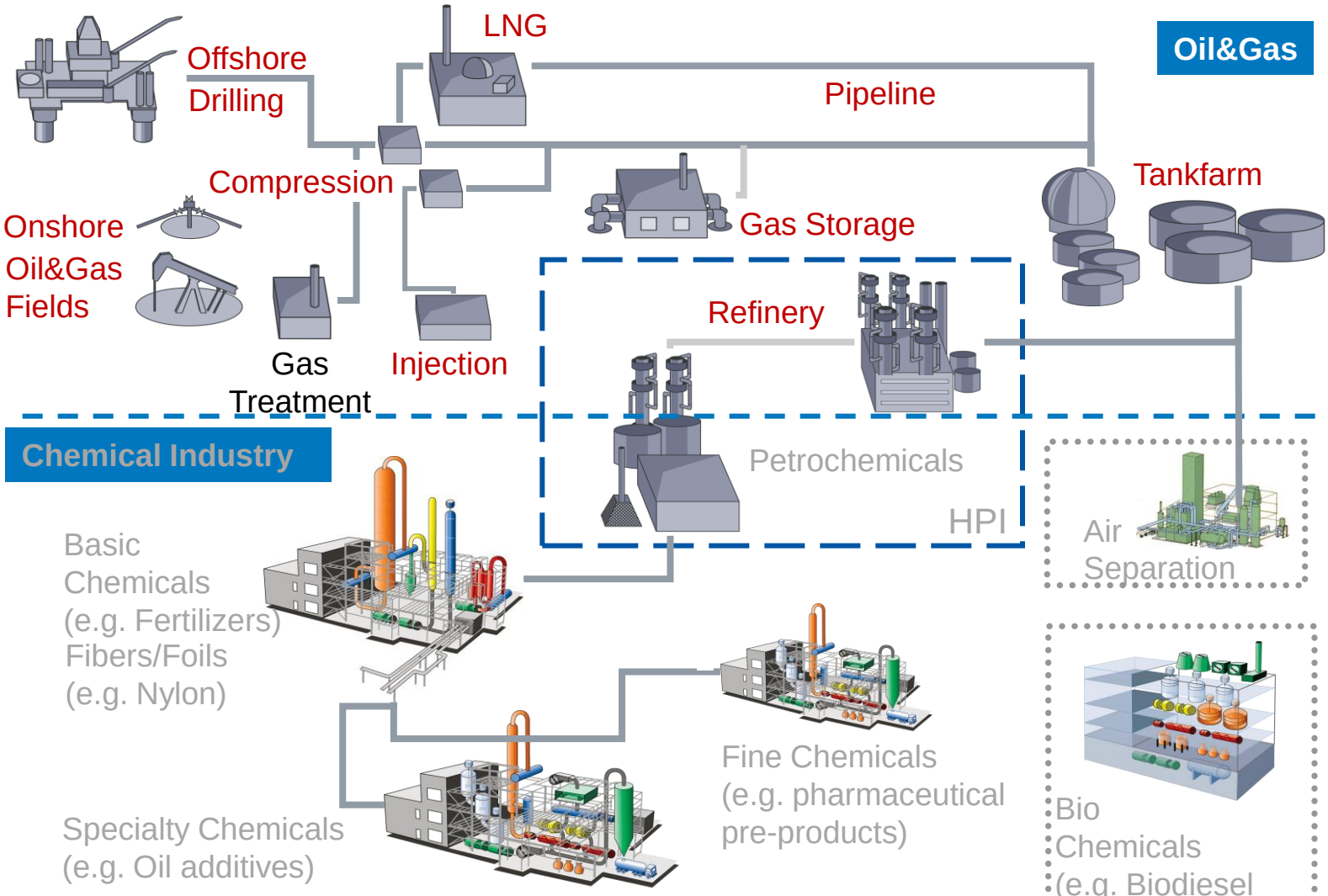
Oil&Gas industry
process measurement product fit

SIEMENS

Market segmentation



process measurement applications with natural gas and hydrocarbon liquids

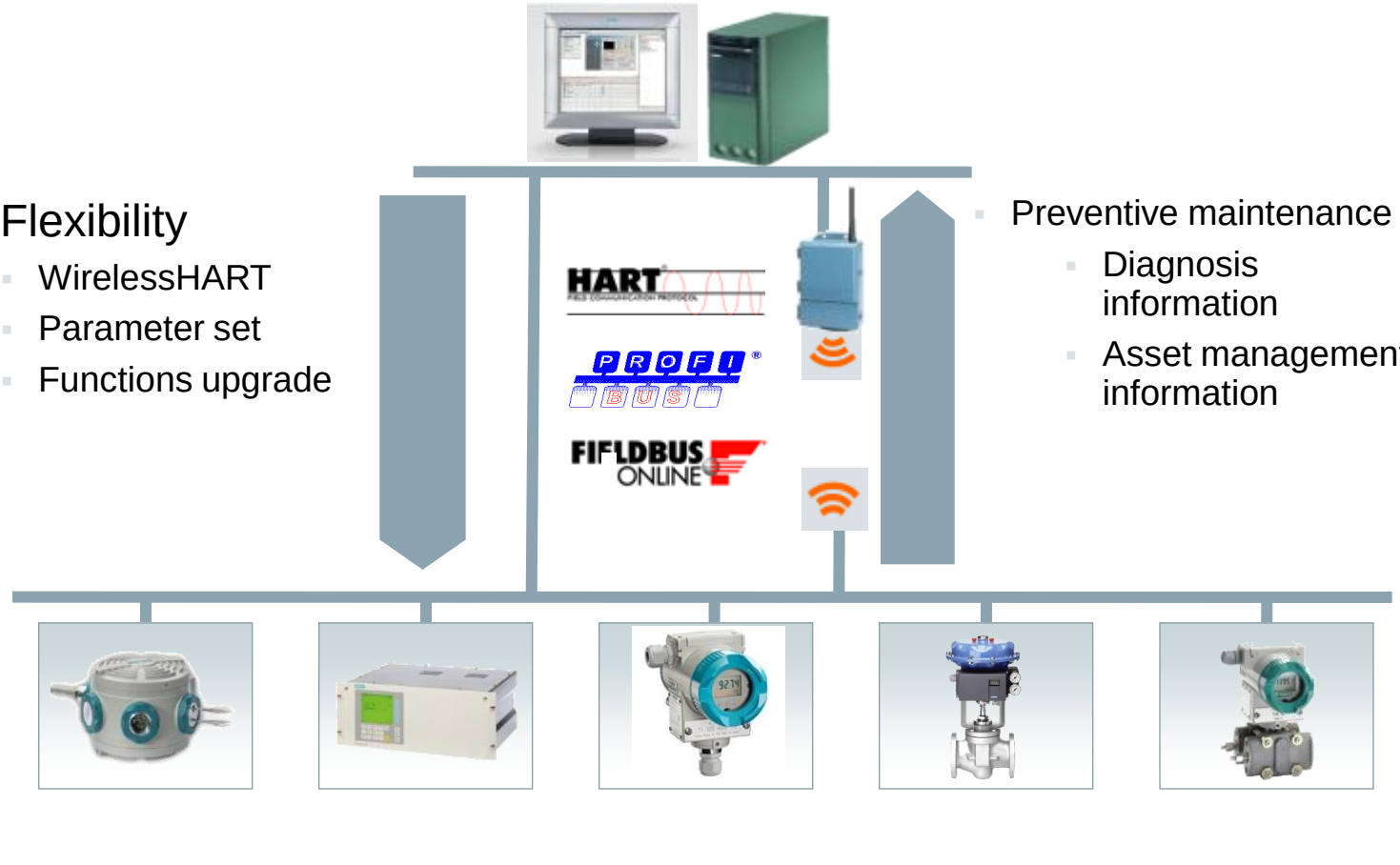
- **Upstream**
  - Wellhead control
  - FPSO / off-shore (Floating production, storage and offloading. An alternative to pipelines.
  -)
  - Natural gas desanding
  - Gas dehydration
  - Gas treatment
  - NGL recovery
- **Midstream**
  - Natural gas pipelines (compression, metering, etc.)
  - Leak detection and location
  - Underground storage
  - LNG processing
  - LNG transportation (tanker, LNG vessel)
  - Storage in tank farms and terminals
- **Downstream**
  - Gas-to-Liquid (GTL) processing

Communication with the Automation System

PI portfolio is well integrated and compatible with different automation systems

Flexibility

- WirelessHART
- Parameter set
- Functions upgrade



- Preventive maintenance
  - Diagnosis information
  - Asset management information

Solution for field device integration wired or wireless (ATEX – Ex)

process measurement for wellhead control and blow-out prevention

IEC60870-5-104

SIPLUS RIC IEC on S7-300 with CP343-1
(master and slave)

SIMATIC HMI

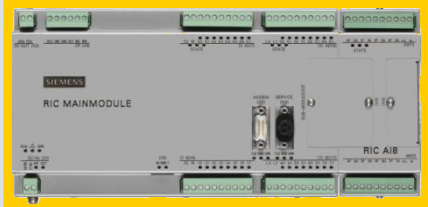
IEC60870-5-104

IEC60870-5-104

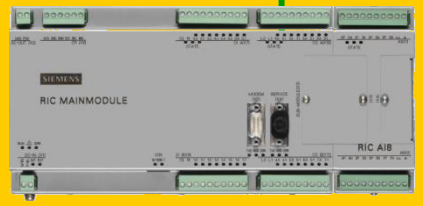
Ethernet

Ethernet

SCADA-System
- SIMATIC PCS7
- SIMATIC WinCC
- PVSS (ETM)
- others

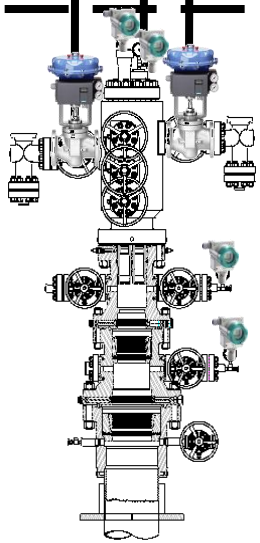


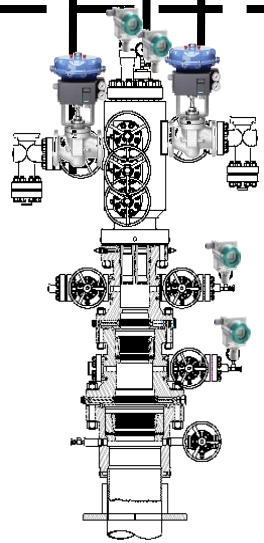
SIPLUS RIC
(slave 1)



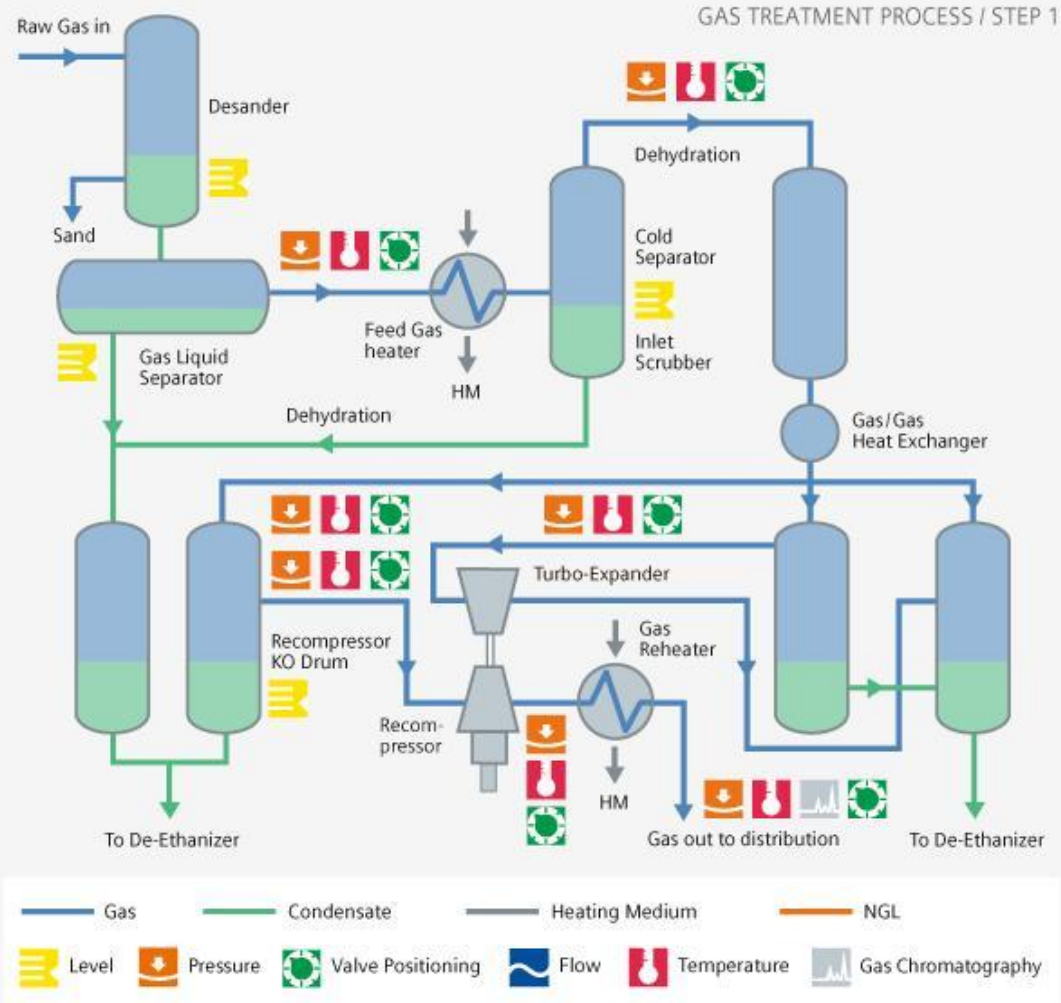
SIPLUS RIC
(slave n)

I/O direct wiring
(0/4 - 20mA)





Upstream: natural gas treatment / step 1



Temperature

SITRANS TH300, TH400

Pressure

SITRANS P DSIII

Flow

SITRANS Clampon
FUG1010, FUH1010

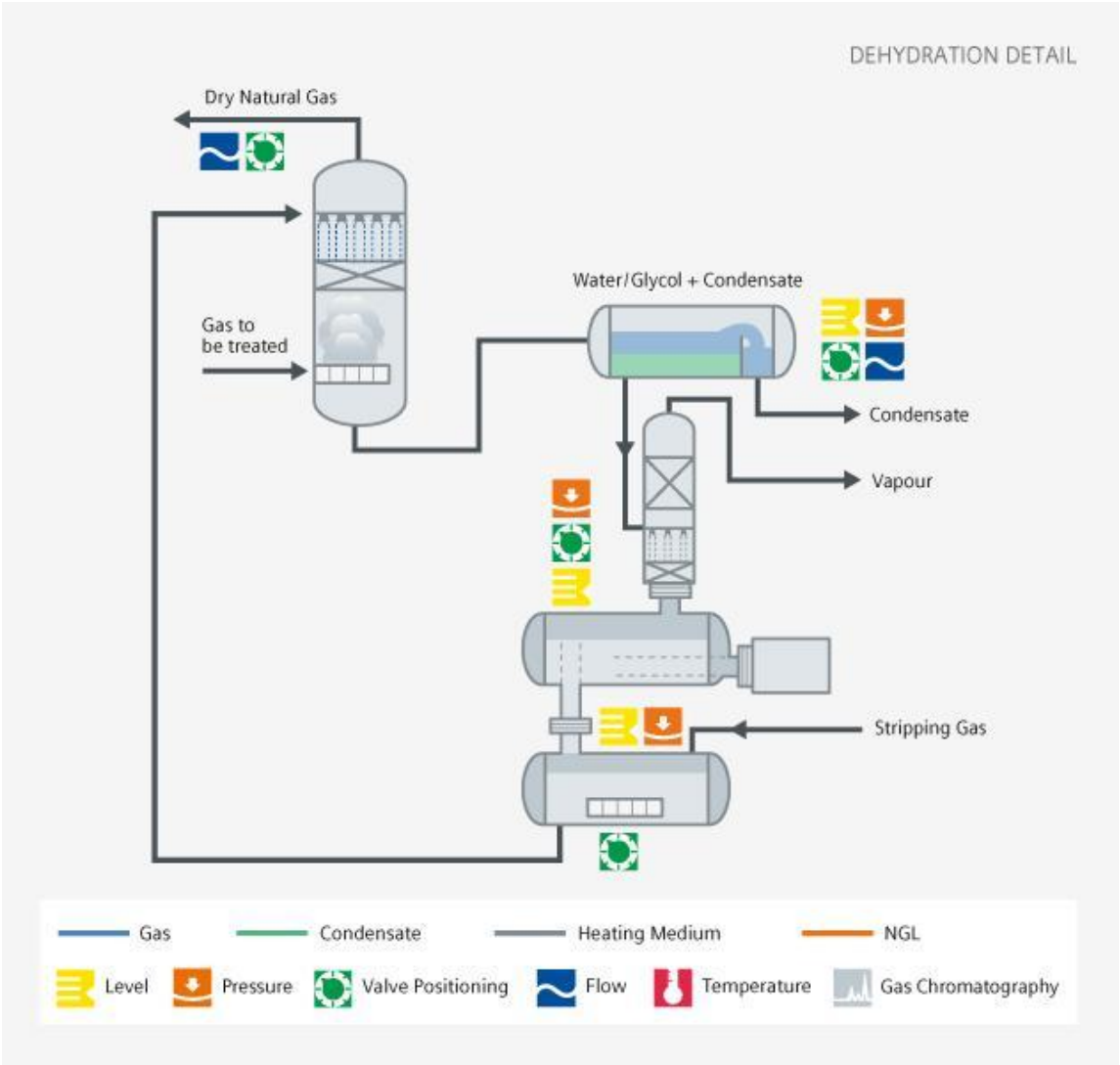
Valve Positioner

SIPART PS2

Gas Chromatography

SITRANS CV,
MicroSAM,
MAXUM edition II

Upstream: natural gas dehydration details



Temperature

SITRANS TH300, TH400

Pressure

SITRANS P DSIII

Flow

SITRANS Clampon
FUG1010, FUH1010

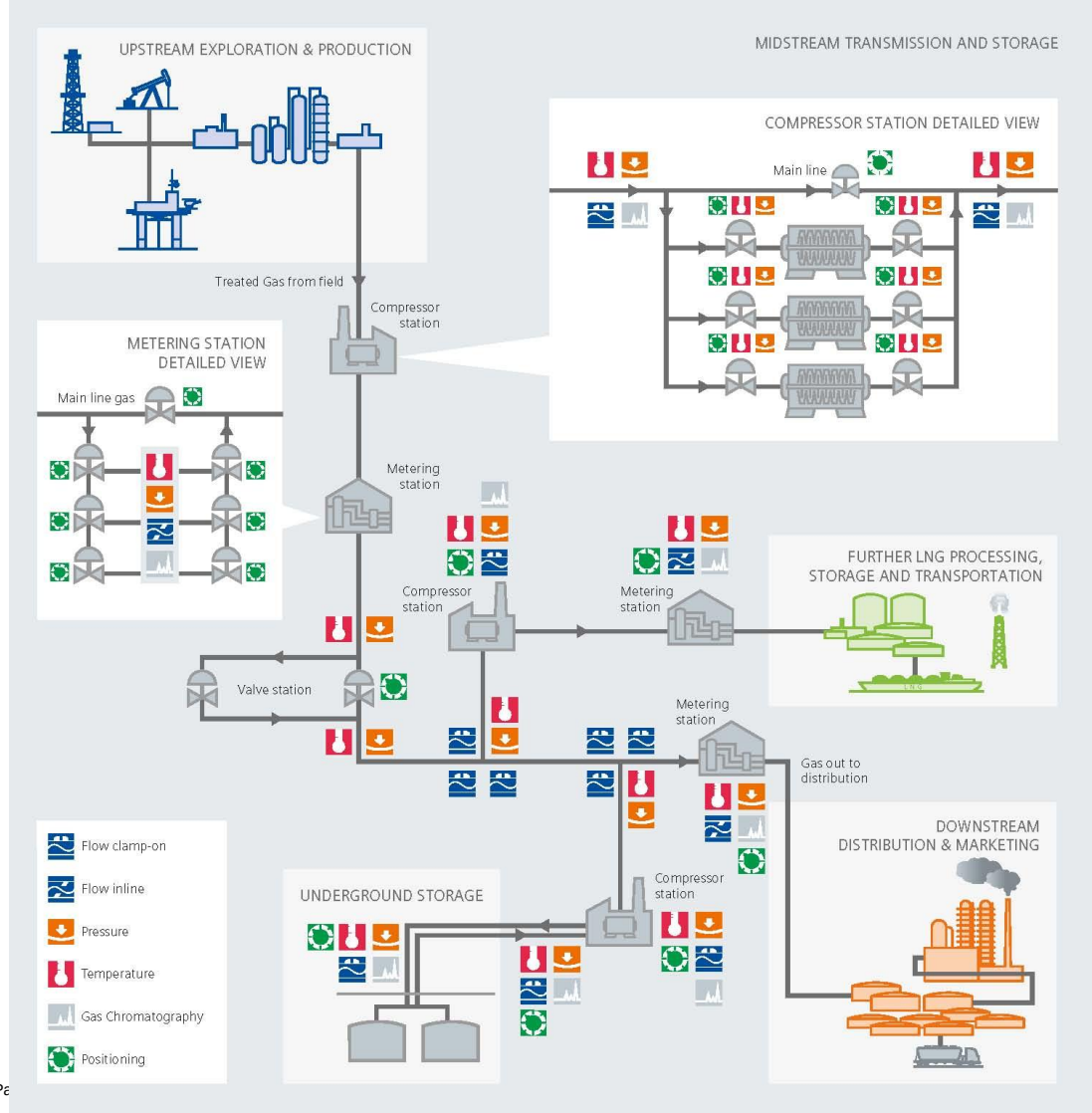
Valve Positioner

SIPART PS2

Gas Chromatography

SITRANS CV,
MicroSAM,
MAXUM edition II

Midstream: process measurement pipelines



Temperature

SITRANS TH300, TH400

Pressure

SITRANS P DSIII

Flow

SITRANS Clampon
FUG1010, FUH1010

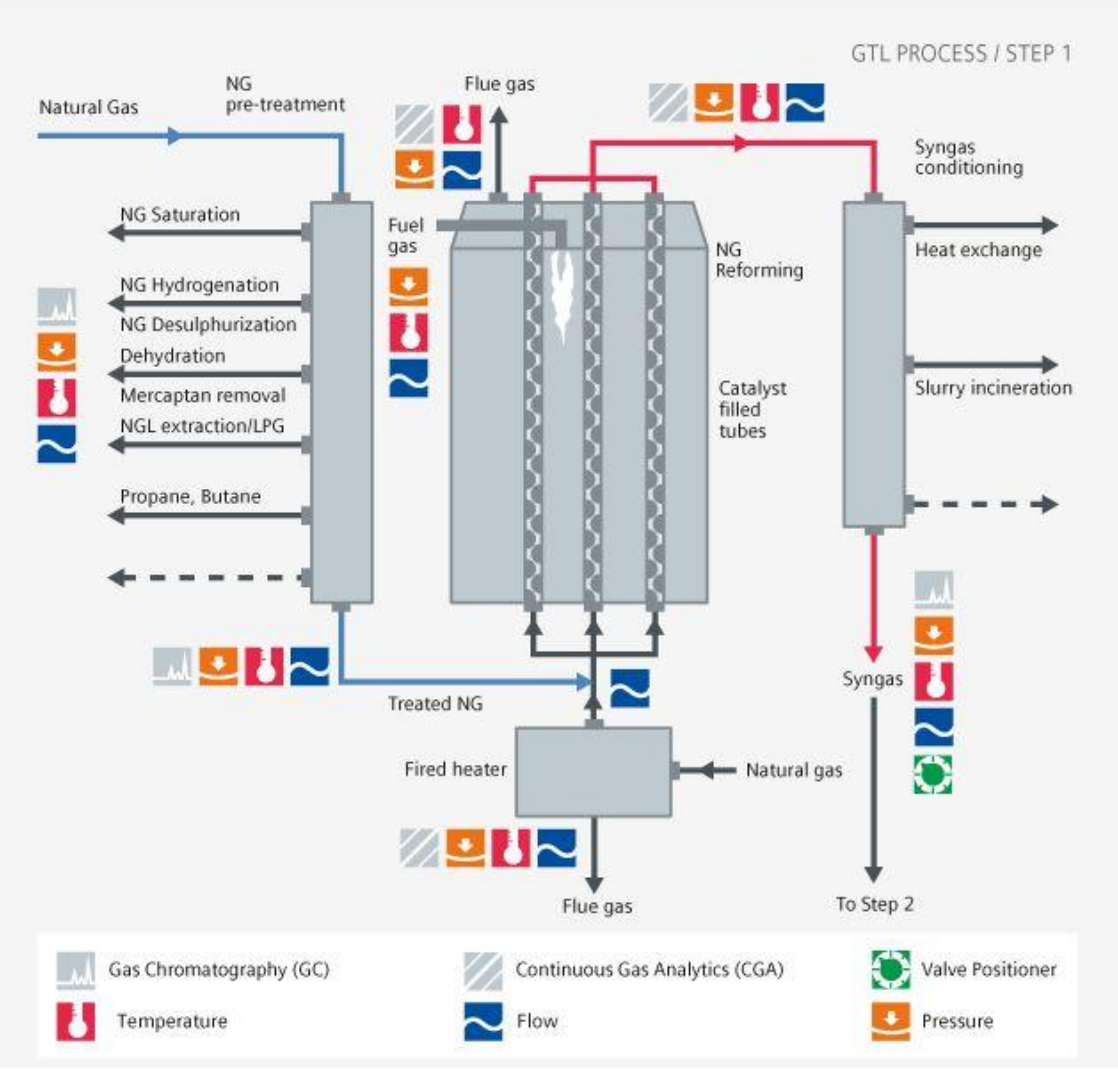
Valve Positioner

SIPART PS2

Gas Chromatography

SITRANS CV,
MicroSAM,
MAXUM edition II

Downstream: GTL processing – step 1



Temperature

SITRANS TH300, TH400

Pressure

SITRANS P DSIII

Flow

SITRANS Clampon
FUG1010, FUH1010

Valve Positioner

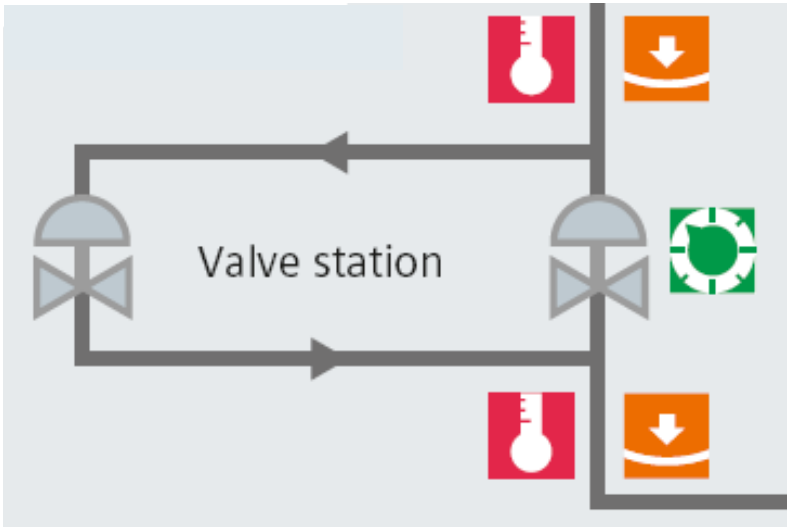
SIPART PS2

Gas Chromatography

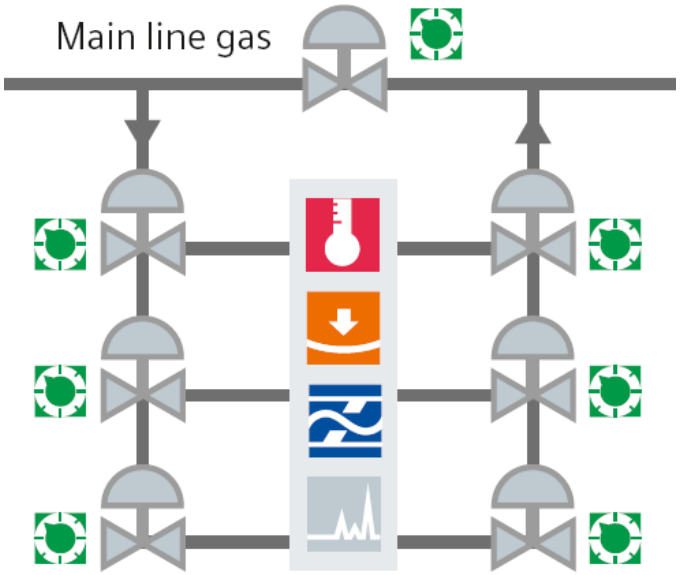
MicroSAM,
MAXUM edition II
OXYMAT 6, ULTRAMAT 6,
CALOMAT 6

Metering / valve stations

Valve stations are located 5-20 miles (8-32 km) apart and allow pipeline monitoring and management.



METERING STATION
DETAILED VIEW



SIPART PS2 for valve positioning

SITRANS P DSIII for pressure

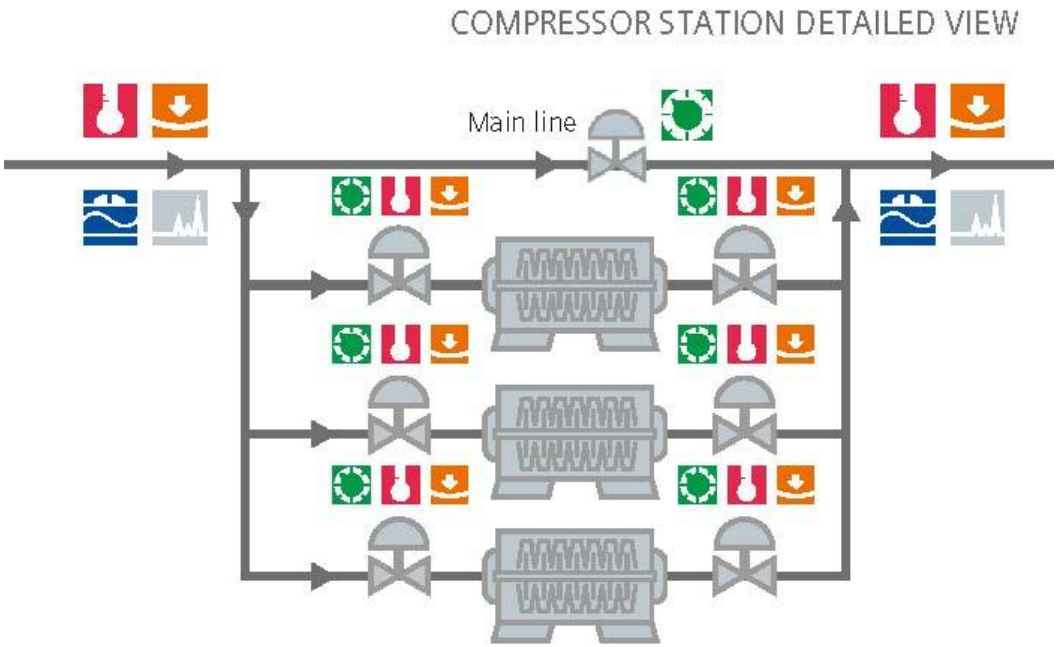
SITRANS T for temperature

Spool meter for flow

MicroSAM gas chromatograph

Compressor stations

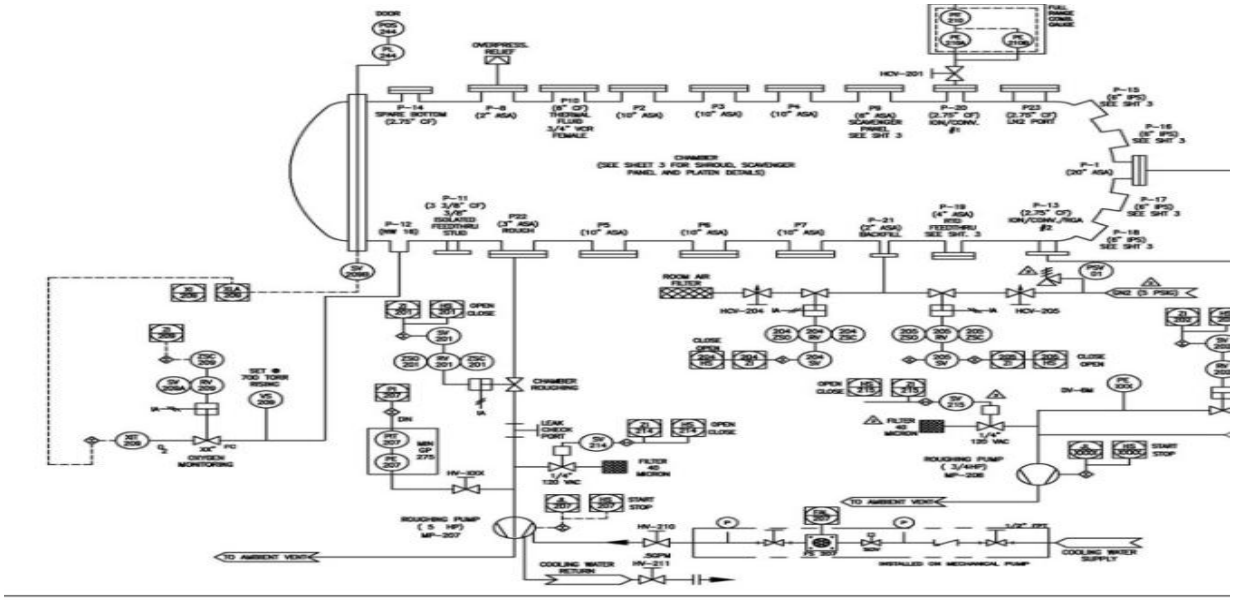
Compressor stations are located 50 – 250 miles (80-400km) apart and are necessary to increase gas pressure in order to push it through the pipeline



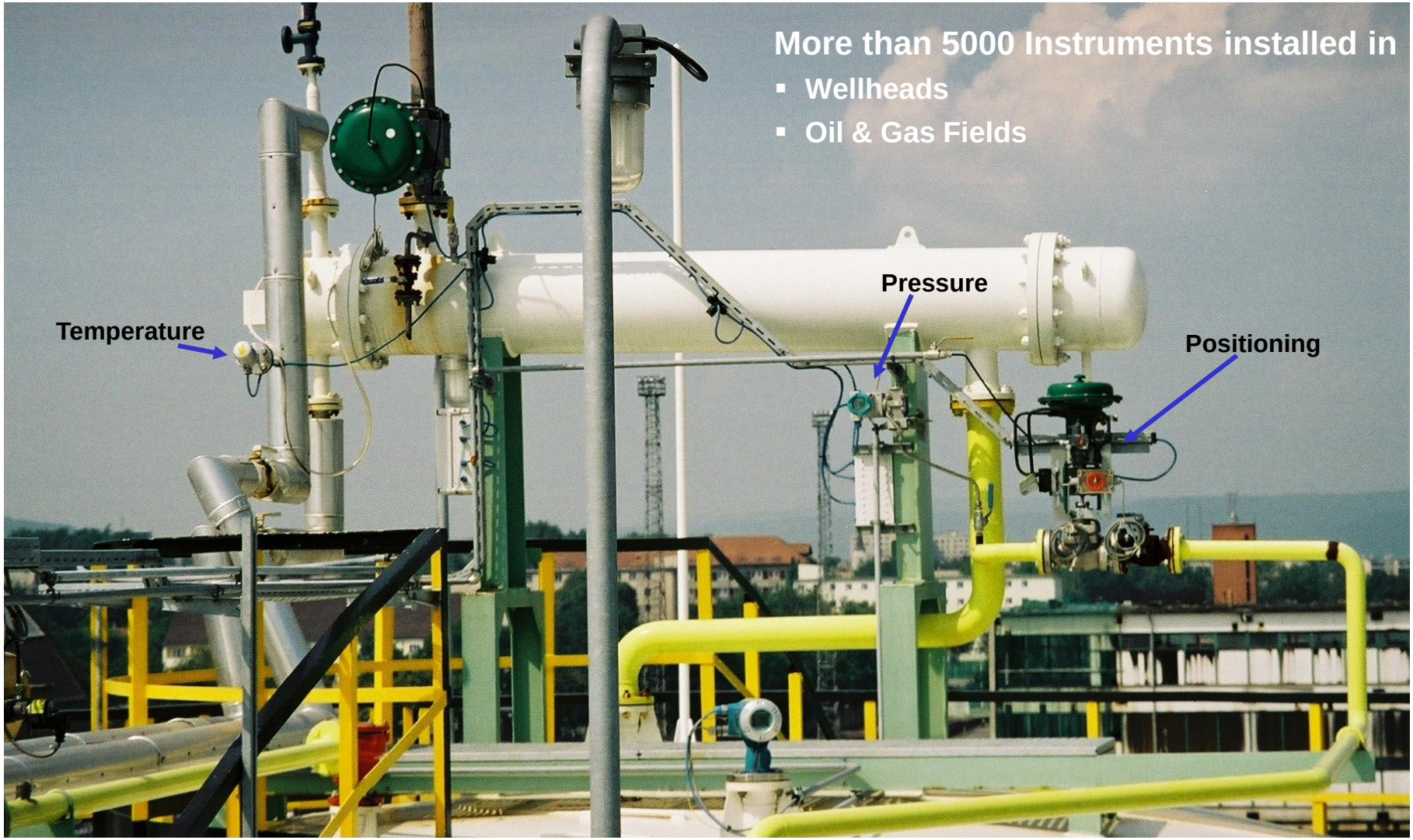
- **SITRANS FUG Clamp-on flow**
- **SITRANS P DSIII for pressure**
- **SITRANS T for temperature**
- **SIPART PS2 for valve positioning**
- **MicroSAM gas chromatograph**

Piping and instrumentation diagram P&ID

1. P&ID from the customer
2. Siemens will offer/chose the right product
3. Ortmann Gmbh will offer the price DDP Iraq



process measurement applications



Valve Positioning
SIPART PS2

Technology:
Positioner

Application/Usage:
Intelligent electro-pneumatic positioner for
linear and rotary actuators

Unique advantages:
Extremely resistant to shocks, vibrations and most hostile environments

Benefits:
Extreme low air consumption

Partial Stroke Test and extended diagnostic functions available to do preventive valve maintenance

Parameterization with push buttons, HART, PROFIBUS or FIELDBUS

German standard

US standard

Installed Base:
> 1 million

Temperature measurement
SITRANS TS500

Application / Usage:

- robust design,
- fully potted or rugged housings

Benefits:

- all industrial temperature applications
- Monitoring the current loop without interrupting the circuit
- Parameterization with HART, PROFIBUS or FIELDBUS communication

three transmitter versions:

Field – head mounted

ATEX

rail mounted

Pressure measurement
SITRANS P DS III and P500

- from 1 mbar up to 700bar
- absolute or differential pressure
- **c**onfiguration via push-buttons in hazardous areas without opening transmitter or
- HART,
- PROFIBUS
- FIELDBUS

Pressure

Level

Valve block

Installed Base:
> 1 million

Flow measurement SITRANS FUS Clamp-on
FUS-LDS Leak Detection System

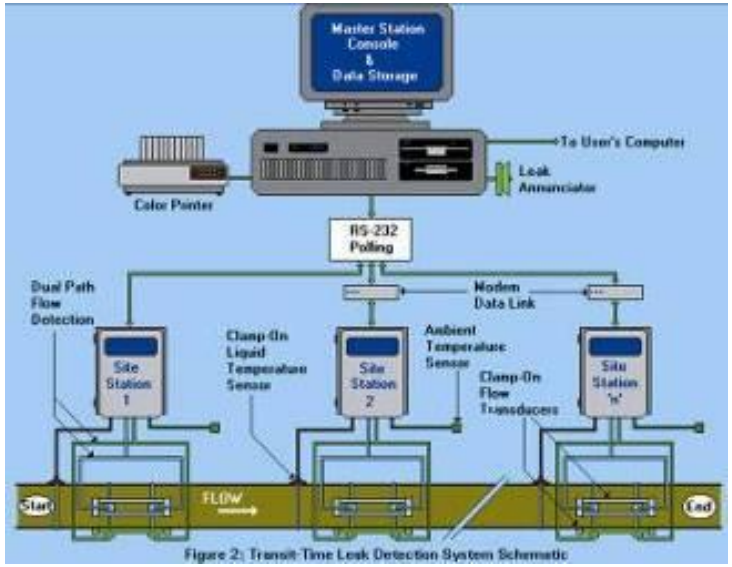


Figure 2: Transit-Time Leak Detection System Schematic

Technology:

Complete software and hardware solution for detecting and localizing pipeline leaks

Application / Usage:

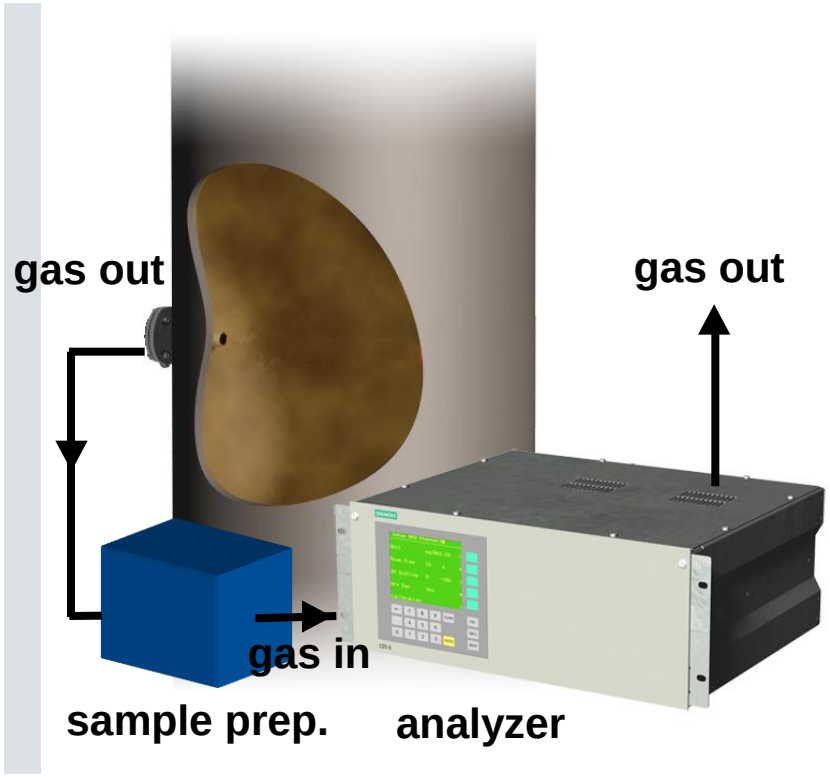
Hydrocarbon or liquid pipeline applications

Benefits:

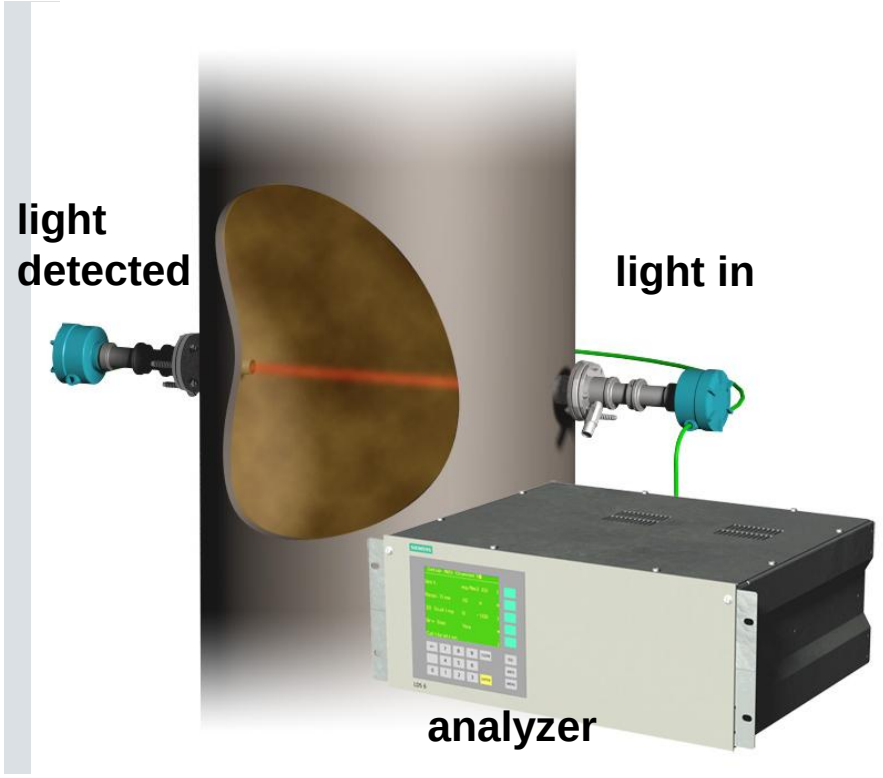
Real-time detection and localization

Siemens Process Analytics
Comparison Extractive – In-situ

Extractive
Ultramat / Oxymat



In-Situ
Laser Spectrometry LDS 6



SIEMENS

Siemens Process Analytics
Product Portfolio

Continuous Gas Analytics

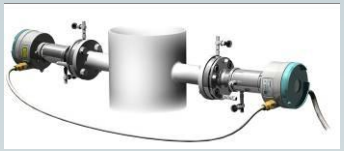
Extractive Analyzer

ULTRAMAT 23
You can messure H2S, SO2, CO, NO, O2 and many other…

Field, Ex

19“ Rack

ULTRAMAT 6 OXYMAT 6 CALOMAT 6
FIDAMAT 6 SIPROCESS UV600



SITRANS SL

In Situ Analyzer

Process Gas Chromatographs

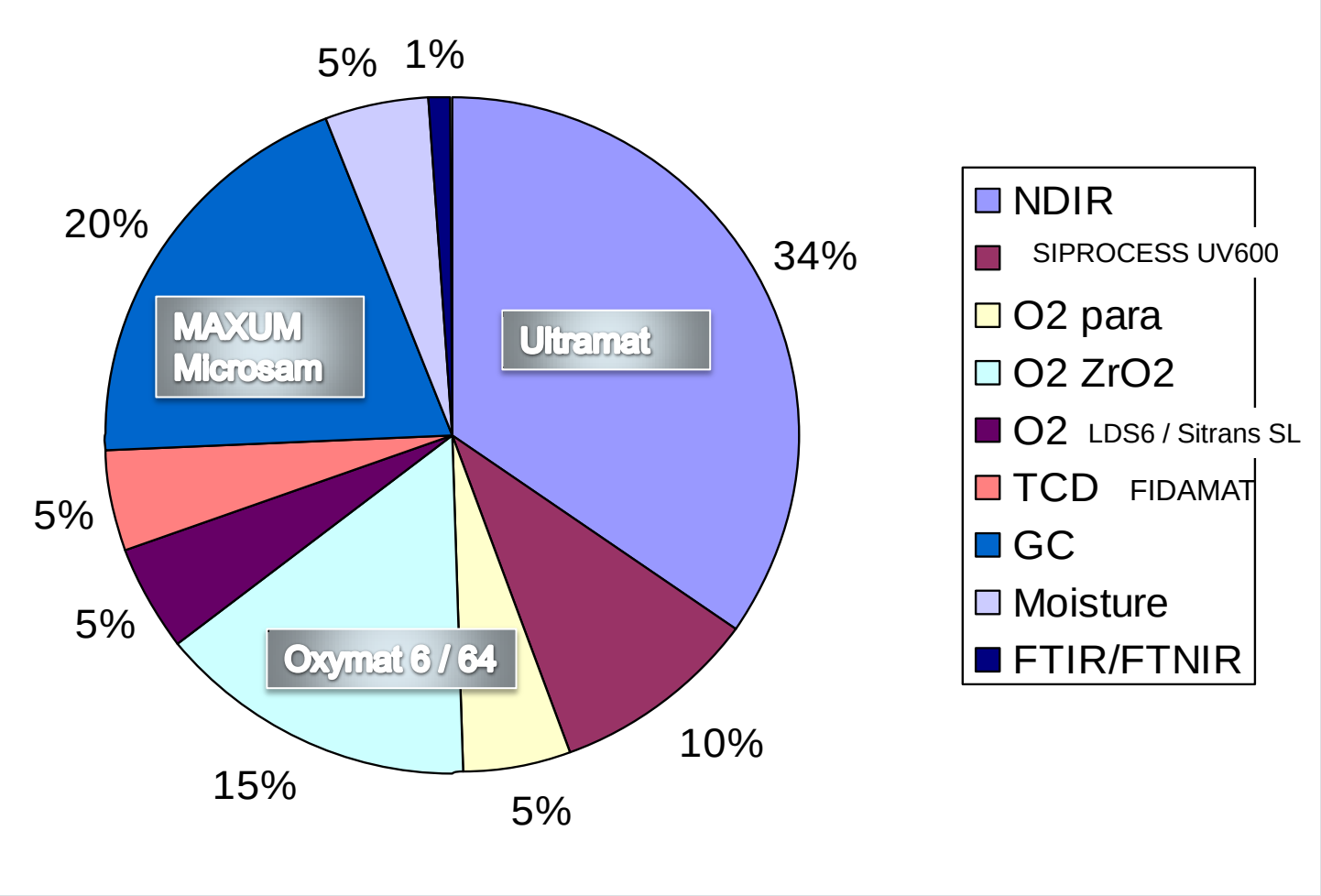
SITRANS CV
Natural gas

MicroSAM
All HC gas types

MAXUM edition II
Universal solution made in Germany

Siemens Process Analytics
Analyzer Technologies in Oil & Gas

Refinery



MAXUM edition II
Typical Applications at Oil&Gas

Industry	Application
Ethylene plants:	Feed composition BTU firing composition Cracked gas composition Product quality control
Claus plants:	Process gas feed Tail gas downstream the last condenser
Refinery:	Flue gas downstream of regenerator Rich oil Fuel gas Gasoline/Light gas oil to blending
Installed base:	> 20.000

MAXUM edition II
Highlights at a Glance

Features	User Benefits
• Run multiple streams in parallel • Redundant applications in one unit • Multiple applications in one unit	• Cost saving Maxum Configurations • Shorter Cycle time
• Guaranteed spare parts availability of 10 year after product discontinuation • Fast service support by sending in diagnostic file (.amd-file) • Full remote service	• Cost saving Spare parts and Service
• Leading performance in repeatability and detection limits	• Reliable measurements

Global System Integration Centers
System Assembly

Project Execution