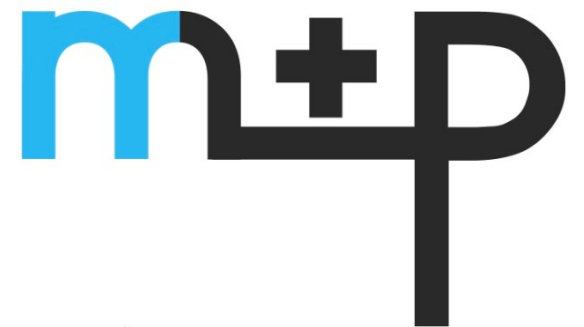




MINERS & PISANI

- ▶ Gas Measurement & Control
- ▶ Lower Costs
- ▶ Improved Efficiency
- ▶ Simplify Your Systems
- ▶ Reduce Risk
- ▶ ***We're Here To Help***



GAS DISTRIBUTION SYSTEM PRESSURE MONITORING

Miners & Pisani

Tom Phillips



PRESSURE MONITORING BENEFITS

▶ **SAFETY!**

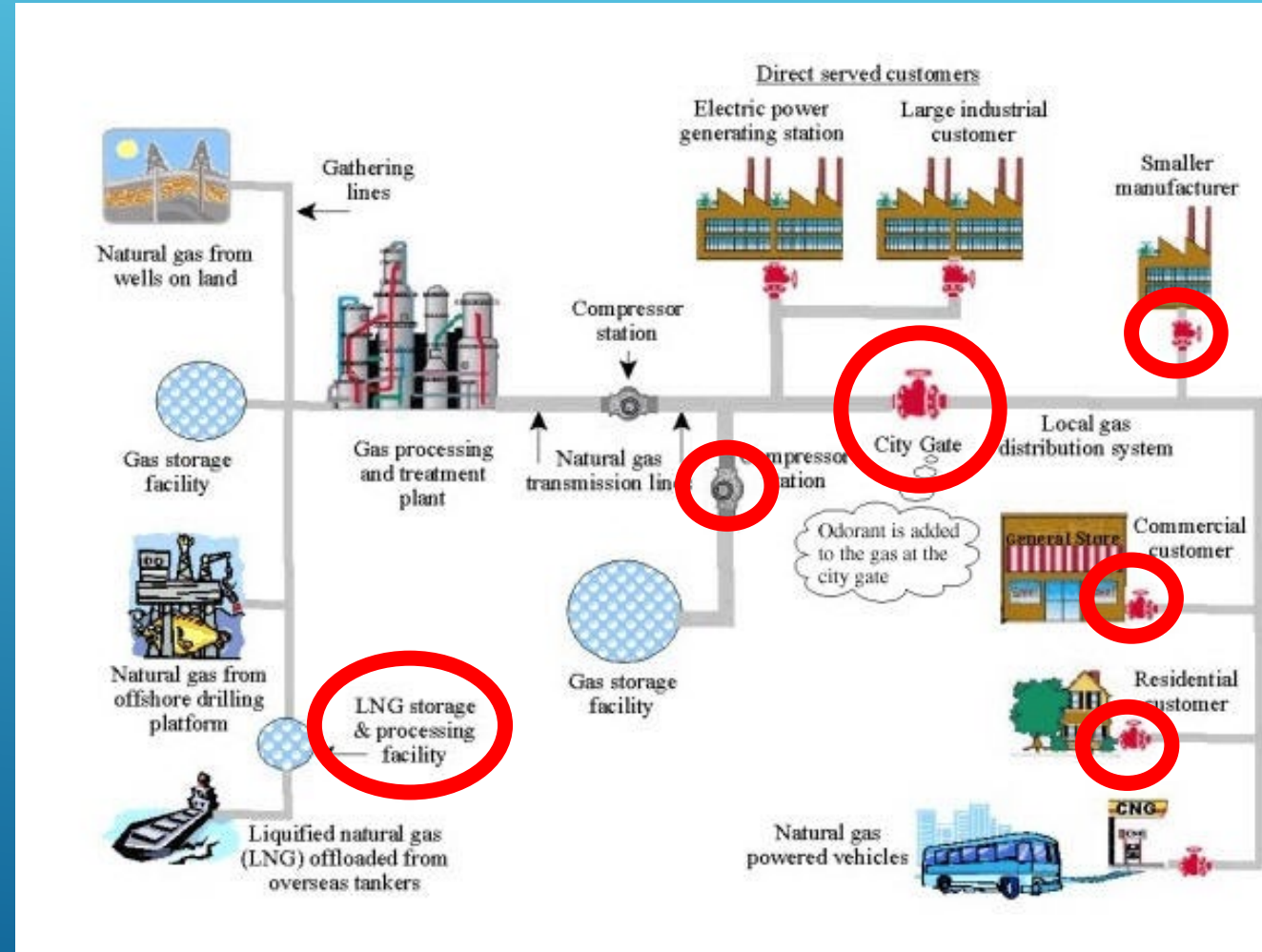
- ▶ Pressure monitoring of gas distribution systems required to ensure the safety of gas company personnel and customers along with accurate Billing.

▶ **Diagnostics & Data**

- ▶ Pressure monitors provide real time alerts and historical pressure behavioral insights to gas control operators and company personnel. Alerts are important to ensure system delivery integrity and the historical data is critical for system modeling and forecasting.
- ▶ Higher fidelity data enhances modeling and forecasting capabilities

LOCATIONS TO MONITOR

- ▶ City Gate Stations
- ▶ Regulator Stations
- ▶ Large End Users and Critical Processes
- ▶ System Tail Ends
- ▶ Residential Customers



MONITORING OPTIONS

- ▶ Pressure Transmitters
- ▶ Differential Pressure Transmitters
- ▶ Solar/AC/TEG Powered Pressure Monitors
- ▶ Battery Powered Pressure Monitors
- ▶ Solar/AC/TEG Powered EVCs
- ▶ Battery Powered EVCs
- ▶ Mechanical Chart Recorders

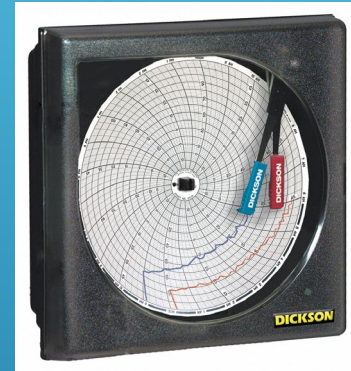


Figure 1: MIWI350

- ▶ **Pressure/Differential Pressure Transmitters (Typically 1P)**
 - ▶ Typically used at gate stations where RTUs are present and monitor the following:
 - ▶ Upstream, Intermediate, and Downstream pressures
 - ▶ Intermediate pressure data can diagnose upstream regulator failure
 - ▶ Filter DP
 - ▶ Meter DP
 - ▶ Odorant Bulk Storage Vessel Blanket Pressure
 - ▶ Metering pressure for USM, rotary, orifice or turbine meter

THE RIGHT TOOL FOR THE JOB

THE RIGHT TOOL FOR THE JOB

- ▶ **Standalone Pressure Monitors (1P, 2P and 3P)**

- ▶ **Solar/AC/TEG**

- ▶ **Utilized in critical monitoring applications where continuous monitoring and communication with SCADA is required but reliable power is not available.**
 - ▶ **Communication achieved through wireless cell modem.**
 - ▶ **“Call-Out” available 24/7/365**
 - ▶ **Typically used for multi-pressure applications.**

- ▶ **Battery Powered (1P, 2P)**

- ▶ **Utilized further downstream from Solar/AC devices where Solar/AC is not feasible or is cost prohibitive.**
 - ▶ **Communication with SCADA is on a scheduled basis (Hourly, Daily, Weekly, etc.) or when an event has occurred (call-in on exception).**
 - ▶ **In some cases, there may be no communication to SCADA at all (“Digital Chart”).**
 - ▶ **“Call-Out” available during preprogrammed windows or not at all.**
 - ▶ **Typically used for single-pressure applications, but some have options for 2P.**



▶ **Electronic Volume Correctors (EVCs)**

- ▶ Although the primary function of the pressure input to an electronic volume corrector is for pressure correction of natural gas volume for customer billing, many EVCs allow for configuration of alarms for HI/LO pressure alarms and some can communicate with both billing and SCADA.
- ▶ Monitoring pressure through EVCs allows for the consolidation of equipment without compromising the safety of the downstream gas system.
- ▶ Many EVCs have options for 2P or 3P.

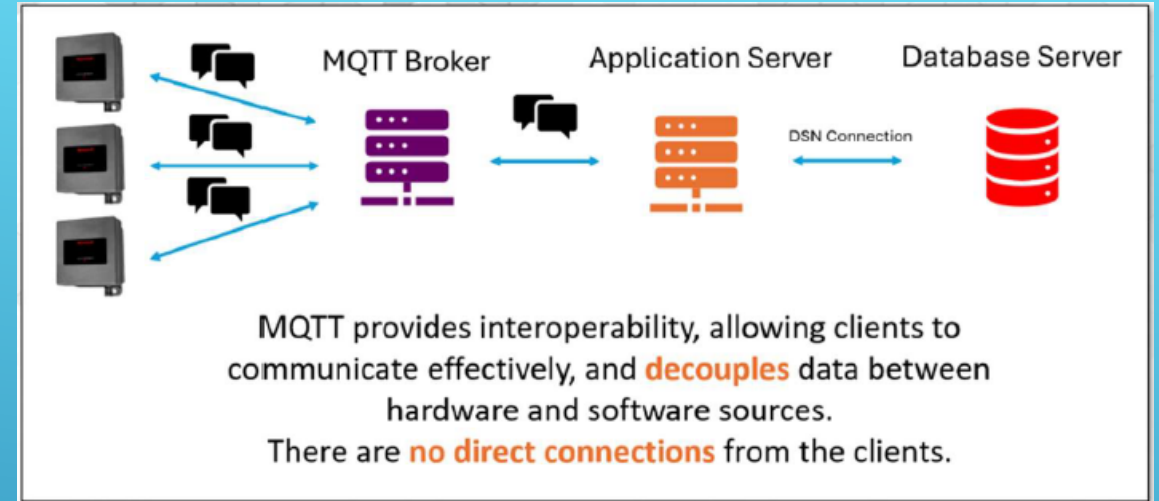
THE RIGHT TOOL FOR THE JOB



- ▶ **Battery Powered Pressure Monitors**
- ▶ Utilized at stations where power (AC/DC or Solar) is not available, not monetarily feasible or not conducive to the installation (ie. Tail-end residence, urban pressure cut stations, etc.)
- ▶ Continuous monitoring can be difficult due to expense of batteries and cost of battery exchanges on a scheduled basis.
- ▶ Many of these applications are call-in on exception only or are not equipped with communication equipment to conserve battery life.

THE RIGHT TOOL FOR THE JOB

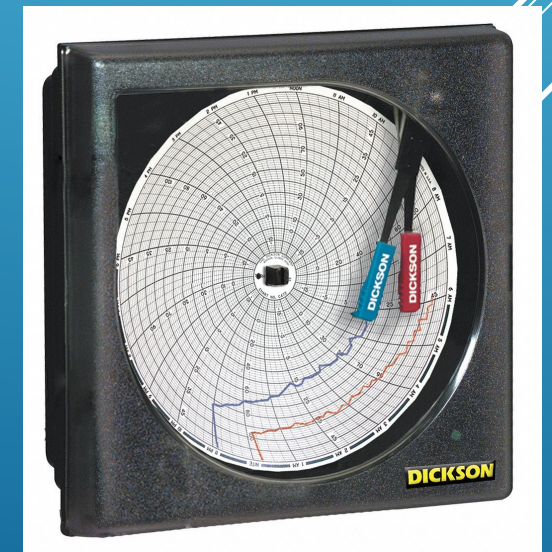
- ▶ EDRX and MQTT
- ▶ New advances in wireless technology have allowed for greater visibility for tail end pressure monitoring devices with decreased battery life and lower cost of ownership.



LEVERAGING NEW TECHNOLOGY

- ▶ Mechanical Chart Recorders
- ▶ Stand-alone pressure recorders that utilize a pen and paper to record pressure.
- ▶ Utilized at stations for record-keeping purposes, particularly at system tail ends.
- ▶ No communications, no alarm capabilities.

THE RIGHT TOOL FOR THE JOB



- ▶ **SCADA & DAQ Systems**

- ▶ Data received by RTUs from pressure transmitters is typically stored locally on company servers (depending on customer size), depending on the amount of data this can become costly to implement and maintain.
- ▶ Data from stand-alone pressure monitors or EVCs can also be sent remotely to SCADA and then stored on company servers.
- ▶ Singular source for data minimizes labor costs for data collection, front-end costs are high.

DATA STORAGE AND REPORTING

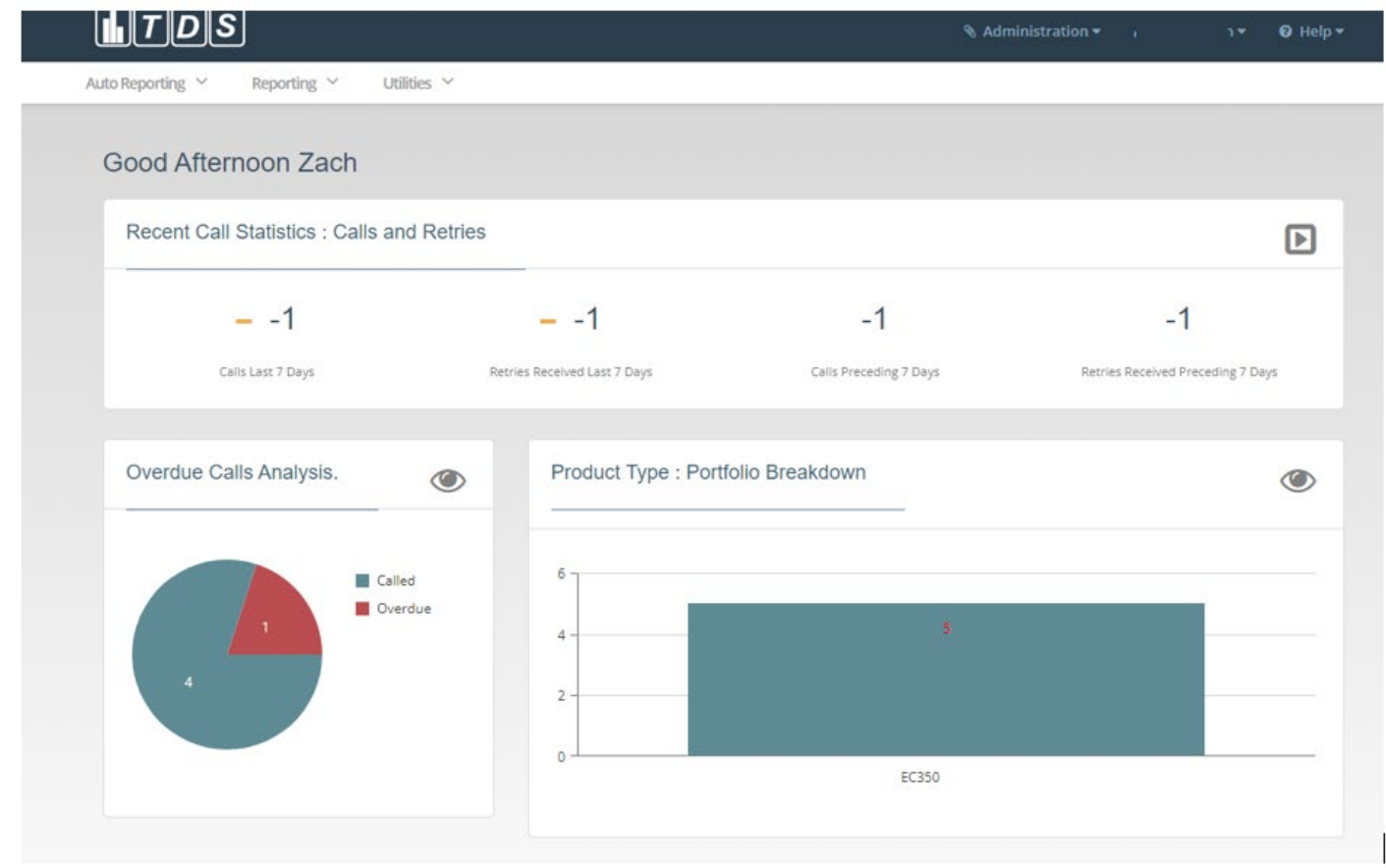
- ▶ Local Storage
- ▶ Many standalone pressure monitors and EVCs have audit trails that can be configured for different intervals (daily, hourly, monthly).
- ▶ These logs can be pulled at company-specified intervals for reporting purposes (Daily, Weekly, Monthly, Quarterly, etc..)
- ▶ Local storage at the device combined with call-in/alert on exception minimizes data storage costs, but labor costs are higher for in-field data collection.
- ▶ Without back-up data collection, there is risk of memory failure due to equipment fault (ie. Lightning strike, vandalism, theft etc..)

DATA STORAGE AND REPORTING

SiteID1	SiteID2	Log	Date	Time	Incremental Cor Vol	Incremental Unc Vol	P1 Interval Avg Press	Interval Avg Gas Temp
0	0	1	11/8/2022	0:00:00	3326	3380	0	68.4
0	0	1	11/8/2022	1:00:00	3325	3380	0	68.51
0	0	1	11/8/2022	2:00:00	3336	3390	0	68.48
0	0	1	11/8/2022	3:00:00	3327	3380	0	68.33
0	0	1	11/8/2022	4:00:00	3335	3390	0	68.52
0	0	1	11/8/2022	5:00:00	3327	3380	0	68.31
0	0	1	11/8/2022	6:00:00	3336	3390	0	68.4
0	0	1	11/8/2022	7:00:00	3332	3390	0	69.03
0	0	1	11/8/2022	8:00:00	3320	3380	0	69.45
0	0	1	11/8/2022	9:00:00	3329	3390	0	69.54
0	0	1	11/8/2022	10:00:00	3317	3380	0	69.76
0	0	1	11/8/2022	11:00:00	3326	3390	0	69.98
0	0	1	11/8/2022	12:00:00	3324	3390	0	70.34
0	0	1	11/8/2022	13:00:00	3323	3390	0	70.56
0	0	1	11/8/2022	14:00:00	3310	3380	0	70.9
0	0	1	11/8/2022	15:00:00	3318	3390	0	71.34
0	0	1	11/8/2022	16:00:00	3316	3390	0	71.59
0	0	1	11/8/2022	17:00:00	851	870	0	71.78

- ▶ Third Party Storage
- ▶ Some companies offer third-party data storage to ease the expense of SCADA infrastructure hardware and software.
- ▶ This allows for more robust data collection and monitoring without the burden of maintaining an entire data collection infrastructure.
- ▶ Customers can receive alarm notifications and automated formatted reports through these third-party platforms to streamline compliance requirements.
- ▶ Cost is typically per device.

DATA STORAGE AND REPORTING



Overdue Calls Analysis.

4

1

Called

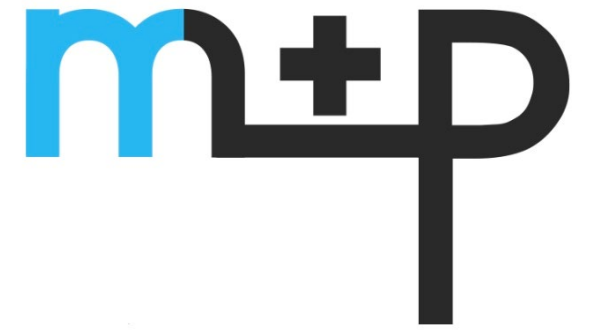
Overdue

Product Type : Portfolio Breakdown

5

EC350

THANK YOU!



FOR ADDITIONAL
INFORMATION CALL
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