AT9000 Advanced Transmitter
Model GTX

Yamatake Europe October 1st, 2008

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Yamatake position in the world

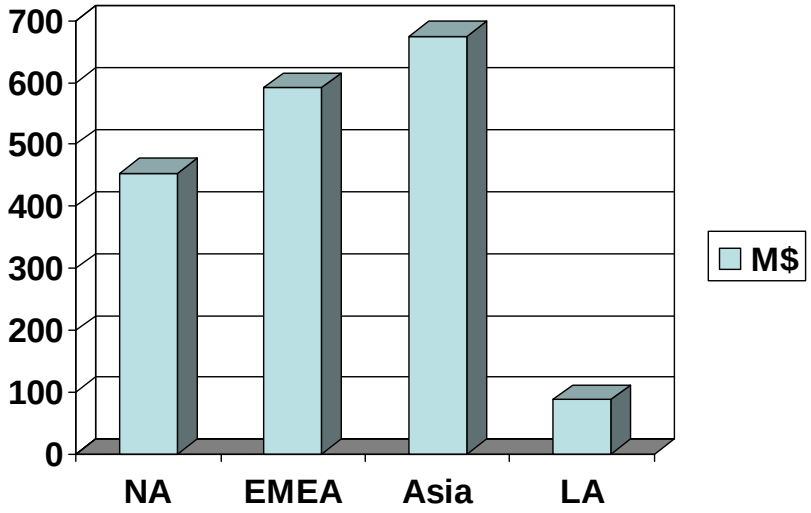
Shares %

Unitts	WW $1807.2M 1950k	NA 453.4M 489.2k	EMEA $591.1M 637.8k	Asia $674.4M 727.7k	LA $88.3M 95.2k
Emerson	43.9	50.7	55.0	28.2	53.9
Yokogawa	21.9	9.6	11.7	40.0	15.7
E+H	7.3	6.5	12.1	3.0	12.1
ABB	6.6	6.6	10.0	4.2	2.2
Fuji	3.8	4.7	2.8	4.7	-
Honeywell	3.4	6.4	2.4	2.2	4.3
Invensys	3.1	6.7	-	2.0	3.8
Yamatake	2.9	-	-	7.6	-
SMAR	2.4	6.2	-	-	3.9
Siemens	2.4	-	3.0	2.6	2.3

- **Expected 2.3b$ in 2011**
- **Large concentration in Middle-East**
- **Europe: mature and replacement business**

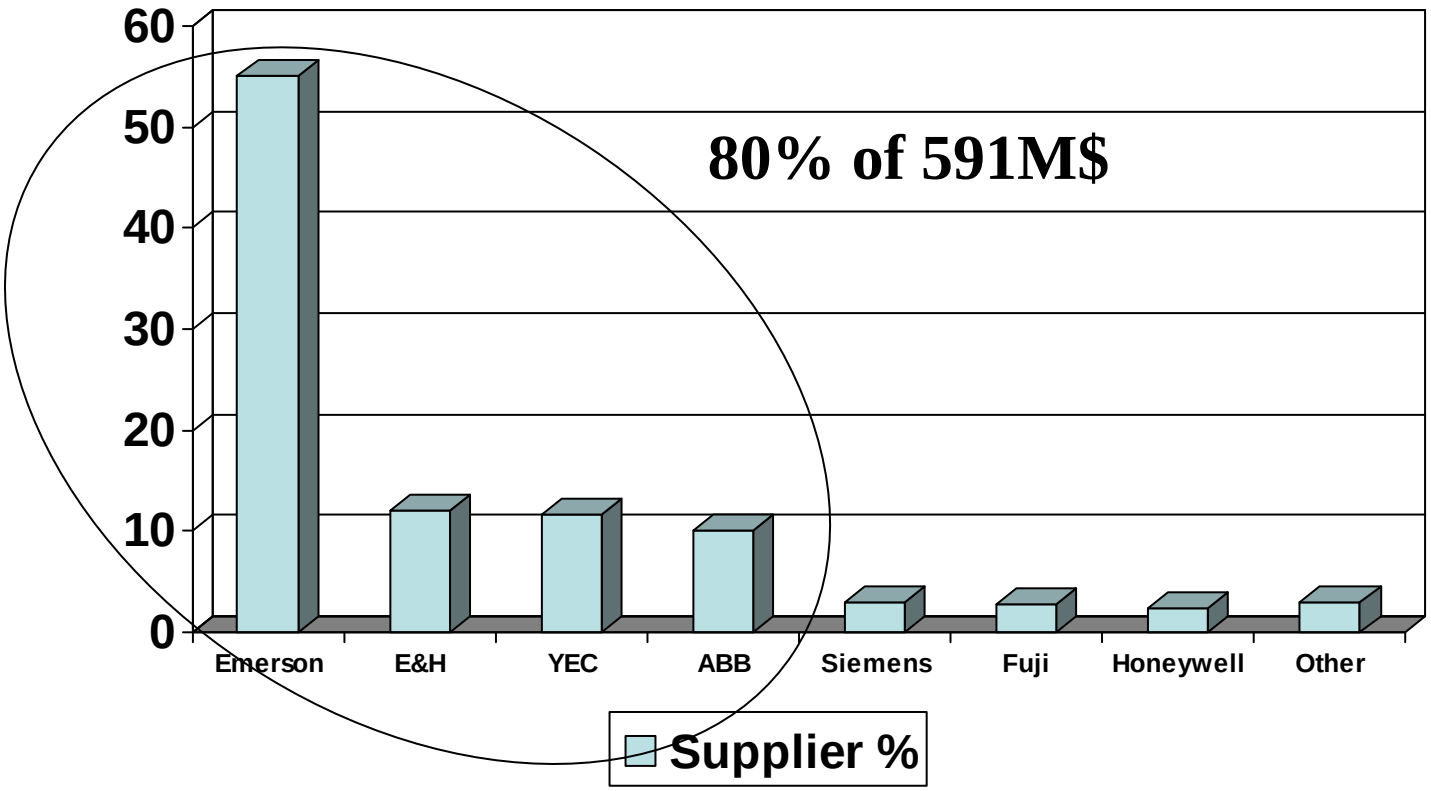
ARC Report 2007,WW

European Market positioning



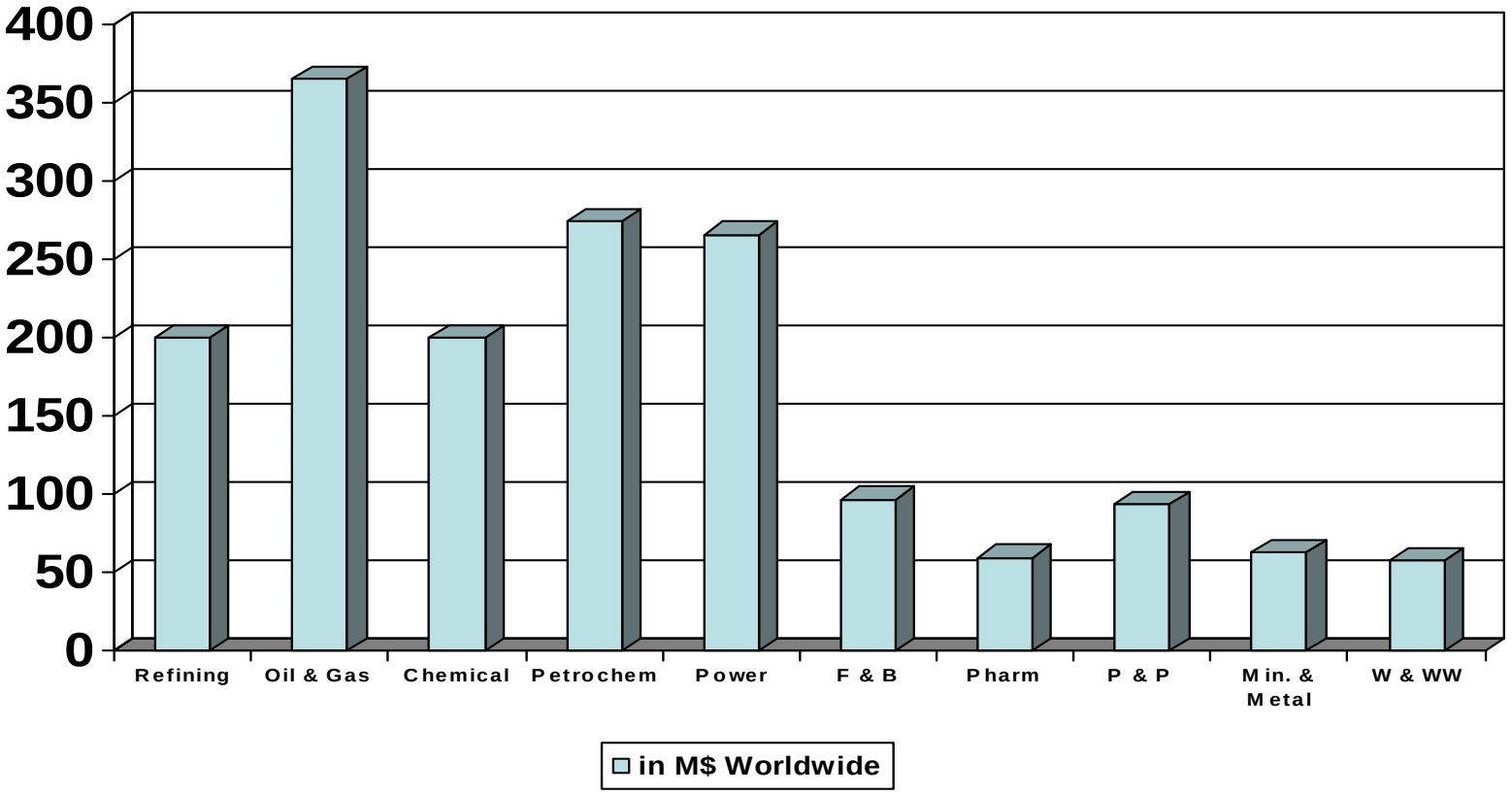
- **Yamatake Europe Market Share: 0.02% better than GTX accuracy!**
- **Fast growth in Asia, but not in Japan**
- **Strong suppliers in Europe: Emerson, E&H, Yokogawa, ABB (80%)**

European Competitors



- **Emerson is dominant, on most applications**
- **Endress has fast growth but suffer about Non DCS availability**
- **Yokogawa and Emerson get benefit of low currency rate**

Applications breakdown



- 3 large areas:
  - Oils & Gas and Refinery
  - Chemical & Petrochemical
  - Power generation

Customer needs in the production system

1. Safety plant operation to avoid accidents
   - Reliability on field devices
   - Safety approvals of devices
2. Stable plant operation to maintain high product quality controlling and high productivity.
   - Reliability on field devices
   - Stability on field devices
   - No clogging in the process line
3. Reducing a implementation and running cost
   - Want to reduce the device cost and maintaining reliability at a same time
   - Want to reduce construction cost
4. Reducing plant down time to maintain stable productivity
   - Gather a variable data from device for predictive maintenance.
   - Analyze the causes of a trouble and immediately discover trouble shooting method
   - Punctual delivery

AT9000 Sales strategy

- Europe is mature Market.
  1. Replacement strategy of ageing installed base
  2. Profitable Business
  3. Improve reliability, accuracy and offer diagnostic
  4. About 50% of installed base should be upgraded by smart TX (20M devices World Wide)
  5. Limited experienced guy at site

AT9000 Sales strategy

Many petrochemical, chemical plants start to adapt SIS

- Safe plant operation has been primary requirement for process automation in chemical, petrochemical and other industries.
- Safety Instrumented System (SIS) constitutes one systematic integrated means for safe plant operation.
- The specifications of such systems have been incorporated into the IEC 61508 standard and the standard has become the de facto standards.

Safe plant operation

Plant user, or system integrator

Construct safety instrumented system (SIS) complied with IEC 61511

Device maker (Yamatake)

Provide the safety instrument complied with IEC 61508 to plant user

AT9000 Sales strategy

- Develop SIL demand
  1. Several accidents make high safety demand in Oil & Gas and Chemical
  2. Competitors offer SIL as option with premium in order to pay back their investment
     - Yokogawa EJA, Emerson 3051C, Honeywell S900 have no SIL level.
  3. Yamatake will offer SIL2 transmitter at free.

SIL certification

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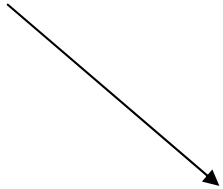
Safety Integrity Level (SIL)

Safety integrity level	Probability of failure on demand (PFD), average (Low Demand mode of operation)	Risk Reduction Factor
SIL-1	>=10^{-2} to <10^{-1}	100 to 10
SIL-2	>=10^{-3} to <10^{-2}	1000 to 100
SIL-3	>=10^{-4} to <10^{-3}	10000 to 1000
SIL-4	>=10^{-5} to <10^{-4}	10000 to 1000

- **SIL is determined by Probability of Failure on Demand (PFD)**
- **Plant users have requested the safety instrument complying with SIL-2**
- **When customers constructs the SIS, GTX meet the requirement.**

Acquire Customer satisfaction

- Stabilize plant operation
  1. To maintain high productivity
  2. Keep high quality level of production



1. Exceptional GTX Stability: 0.1% for 10 years
   - Yokogawa EJA: 0.1% for 5 years
   - Emerson 3051C: 0.125% for 5 years
   - Honeywell S900: 0.15% for 1 year

Acquire Customer satisfaction

- Networking Capability
  1. GTX can be used with:
     - Local Hart 375 handy loader or CFN100 (Yamatake)
     - With EDDL (Electric Device Description Language)
       1. Via hart, trend visualization
       2. Compatible with Emerson AMS Asset Management System)
     - With DTM (Device Tool Manager)
       1. Compatible with FTD application like Fieldcare (E&H) or PACTware
     - With DE protocol for Honeywell DE compatibility
     - With Fieldbus Foundation

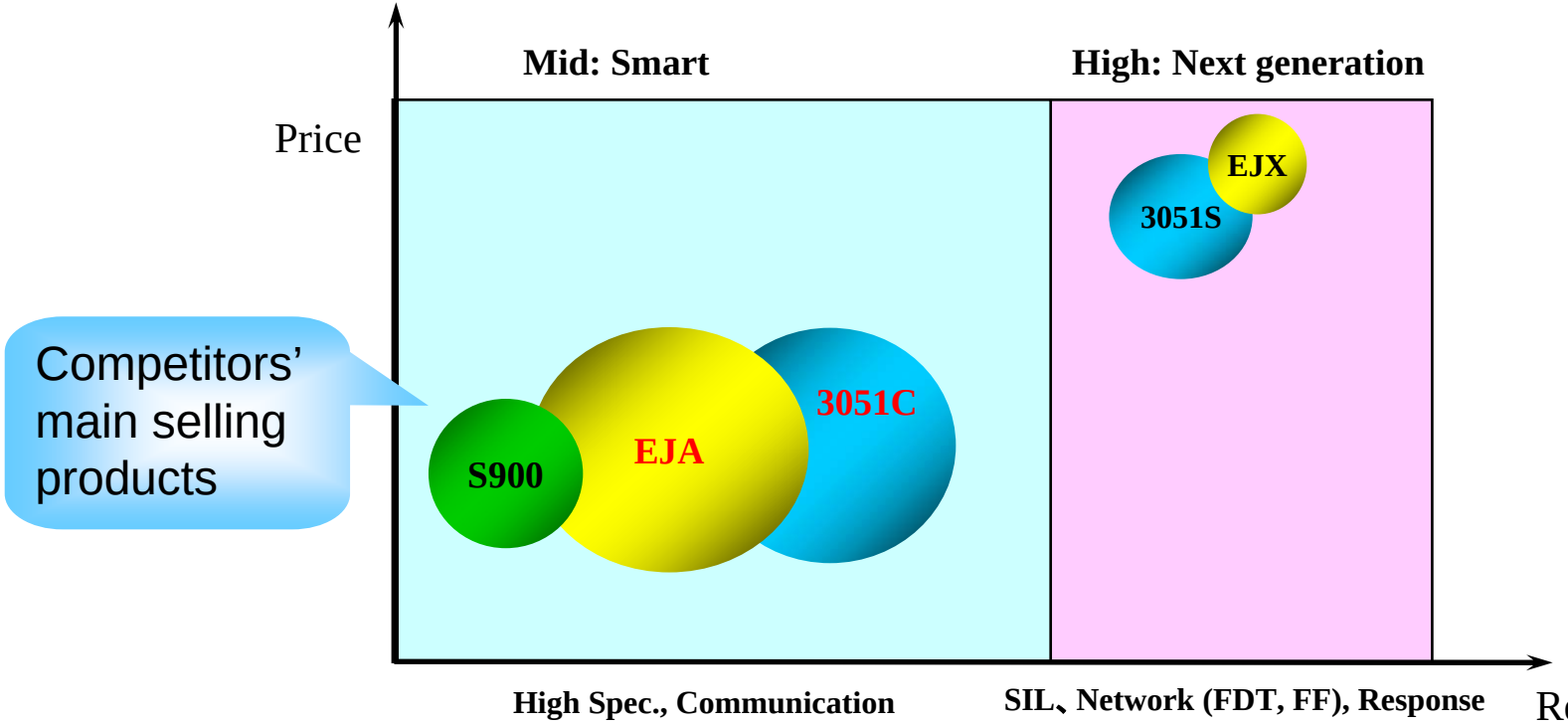
Acquire Customer satisfaction

- Diagnostic capability
  1. GTX can memorizes up to 5 past error messages:
     - Over temperature
     - Over pressure
     - High or/and Low alarm
  2. GTX memorizes data for the past 5 zero correction
     - This is useful for transmitter life time estimation
     - If zero correction exceed threshold value, Tx could be considered as not able to maintain performance

- Easy to migrate
  1. GTX has larger ranges than S900
  2. New: Half inch remote seal
  3. New: low cost GTX30D (0-1 bar) with 35 bars static pressure

Target competitors

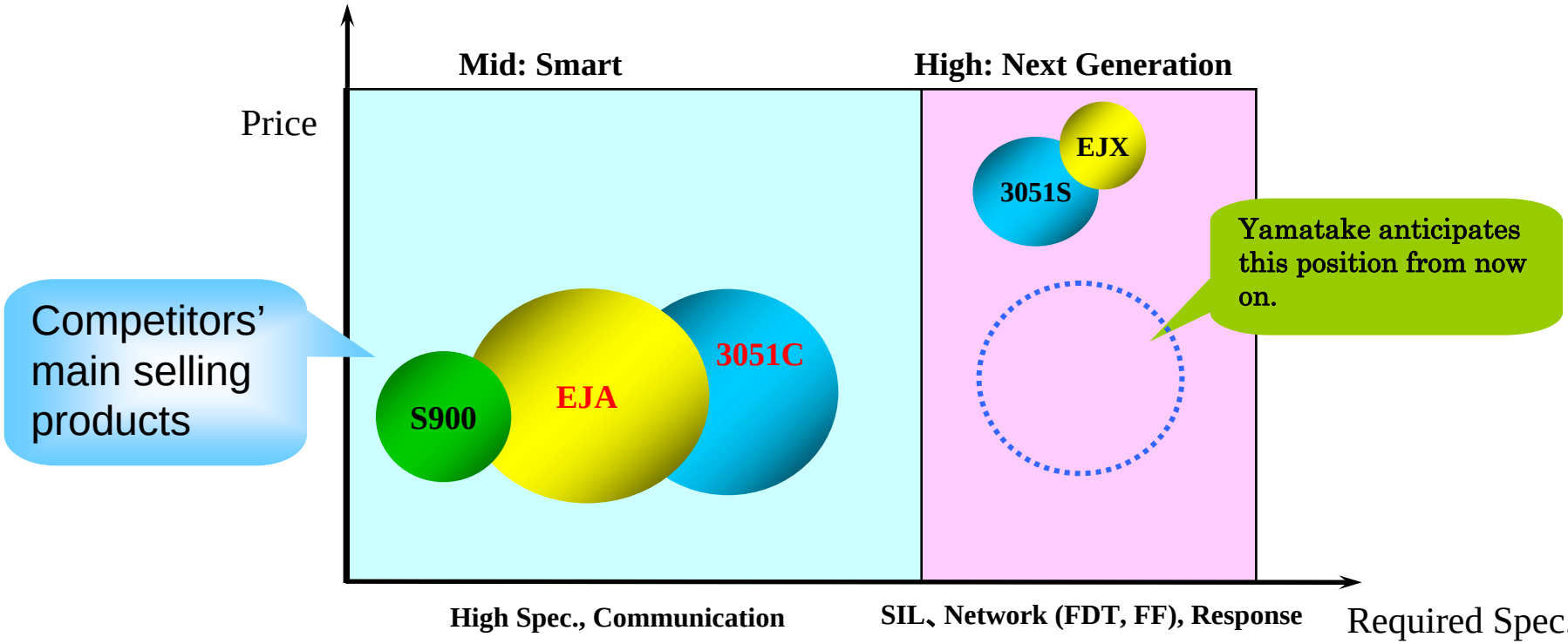
- Target competitors and products
  1. Yokogawa: EJA
  2. Emerson: 3051C
  3. Honeywell: Series 900



Basic strategy

Safety instrumentation with GTX at an attractive price.

Differentiation from competitors;
Yamatake provides high quality and high performance safety transmitter with attractive price.



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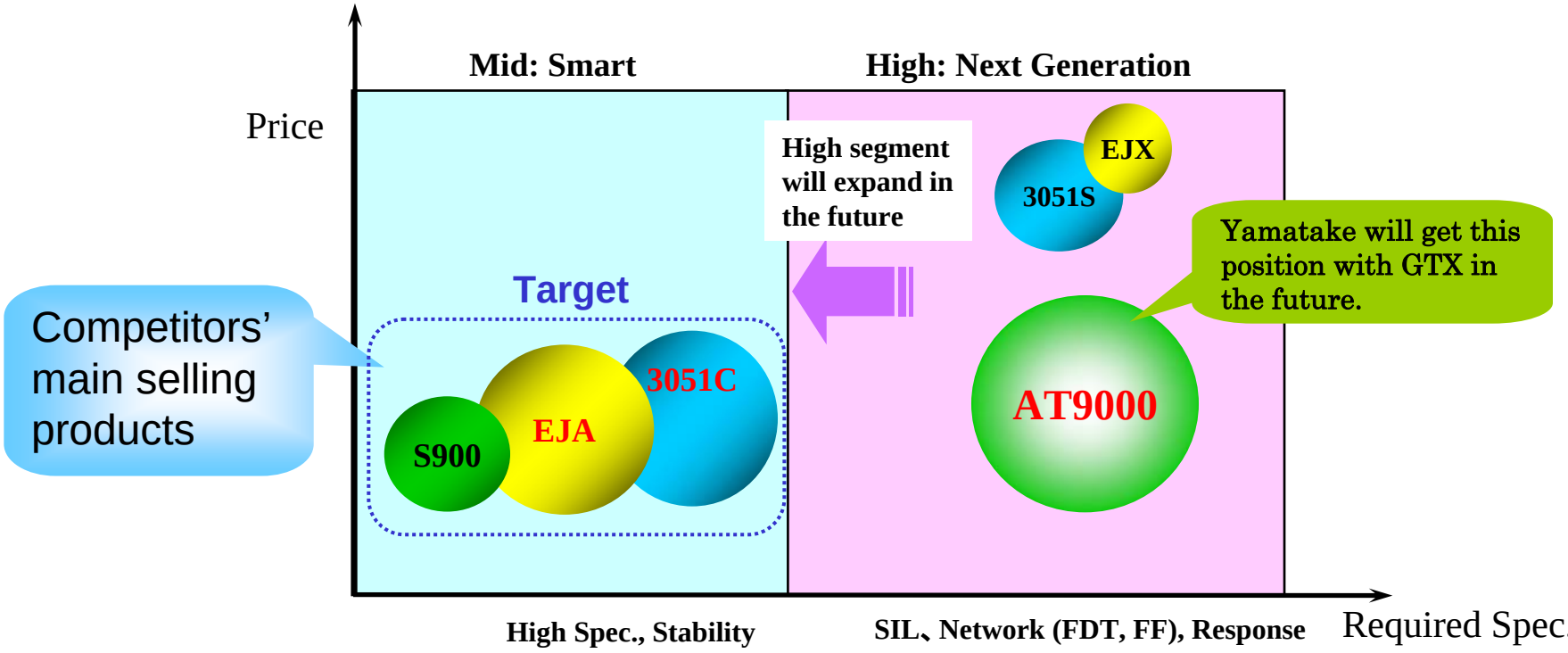


Product presentation

Reliability:
Best in World Class Performance

- High Accuracy
  - +/- 0.04%F.S.
- Faster in response
  - Below 100msec
- High stability
  - +/- 0.1%F.S. for ten-years

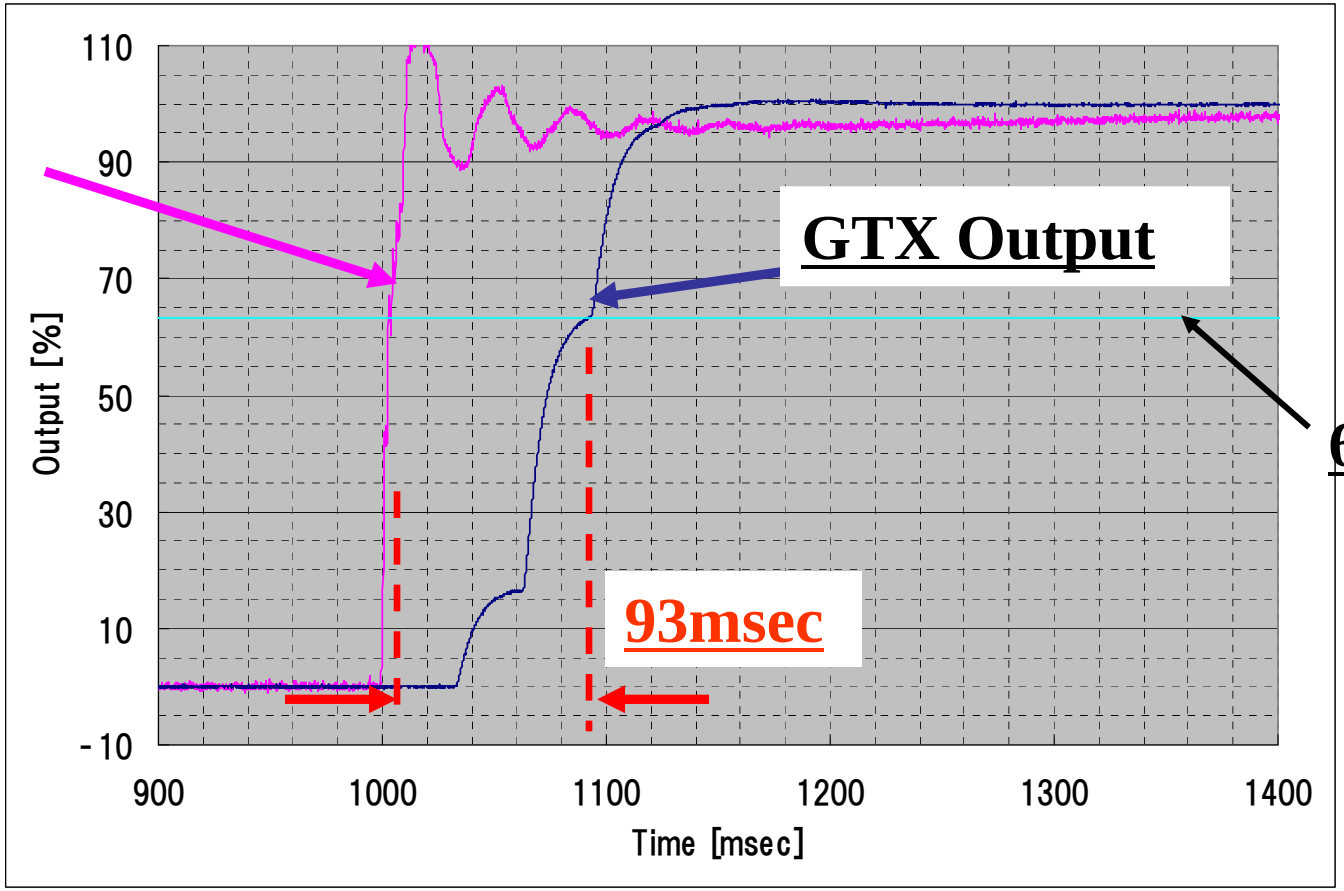
Zero stability:

GTX15D:	**1.0%/10year**
GTX30/31/32/40/41/42D:	**0.1%/10year**
GTX71/72D:	**0.2%/10year**
GTX60G:	**0.1%/10year**
GTX71/82G:	**0.2%/10year**
GTX30/60A:	**0.2%/10year**

All flange and remote-seal type:0.5%/10year

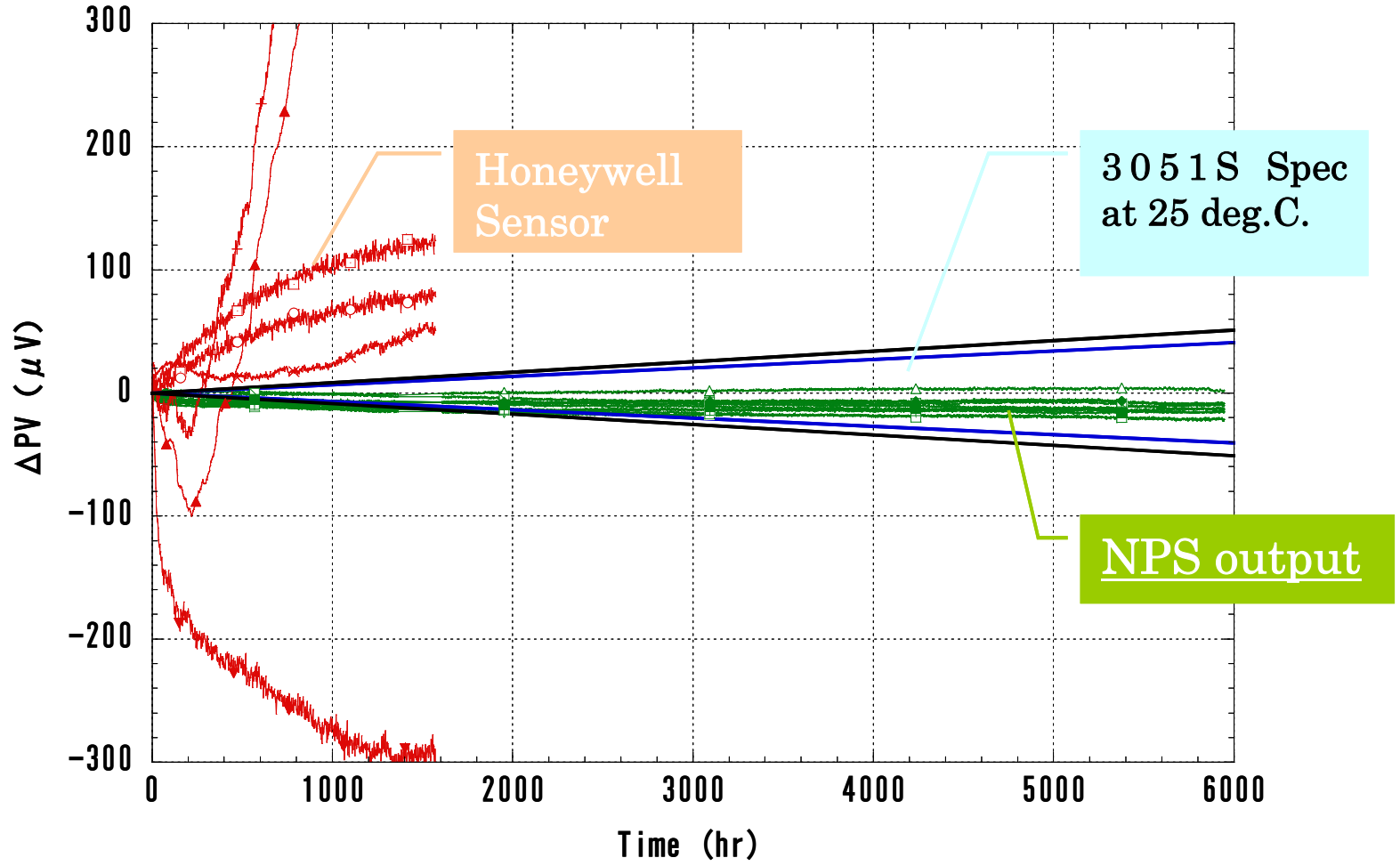
Faster in Response

- Response time: Below 100msec



High Stability

- **Zero drift at 125℃**



High Quality

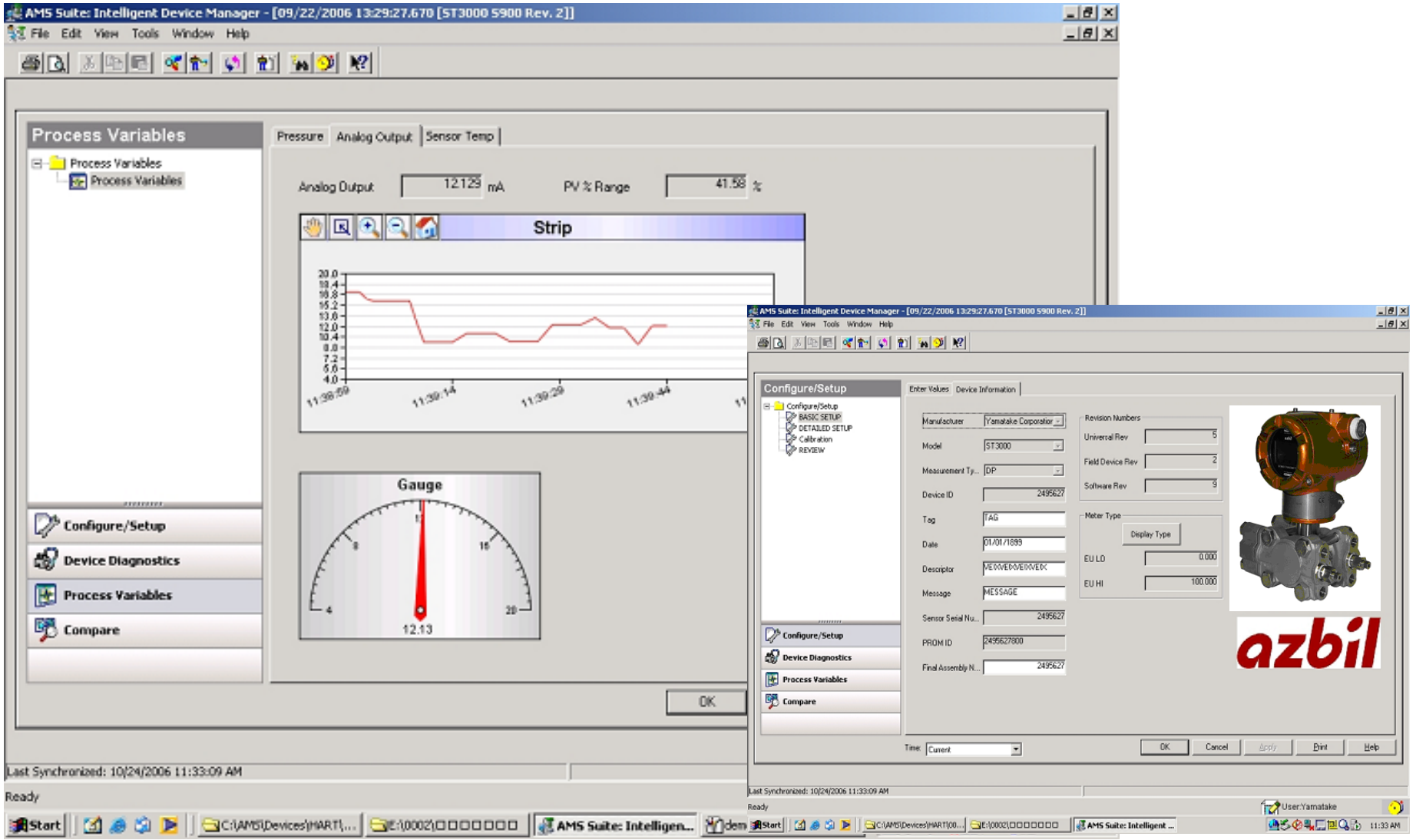
- All technologies are based on over 1,000,000 units field proven technology.
  - Sensor
  - Characterization System
  - Meter Body

ALL MADE BY YAMATAKE IN JAPAN

Availability: Network

- Protocol
  - Analog
    - HART
    - SFN communication (CommPad)
  - Foundation Fieldbus
  - DE protocol
- EDDL
  - AMS Aware
- DTM

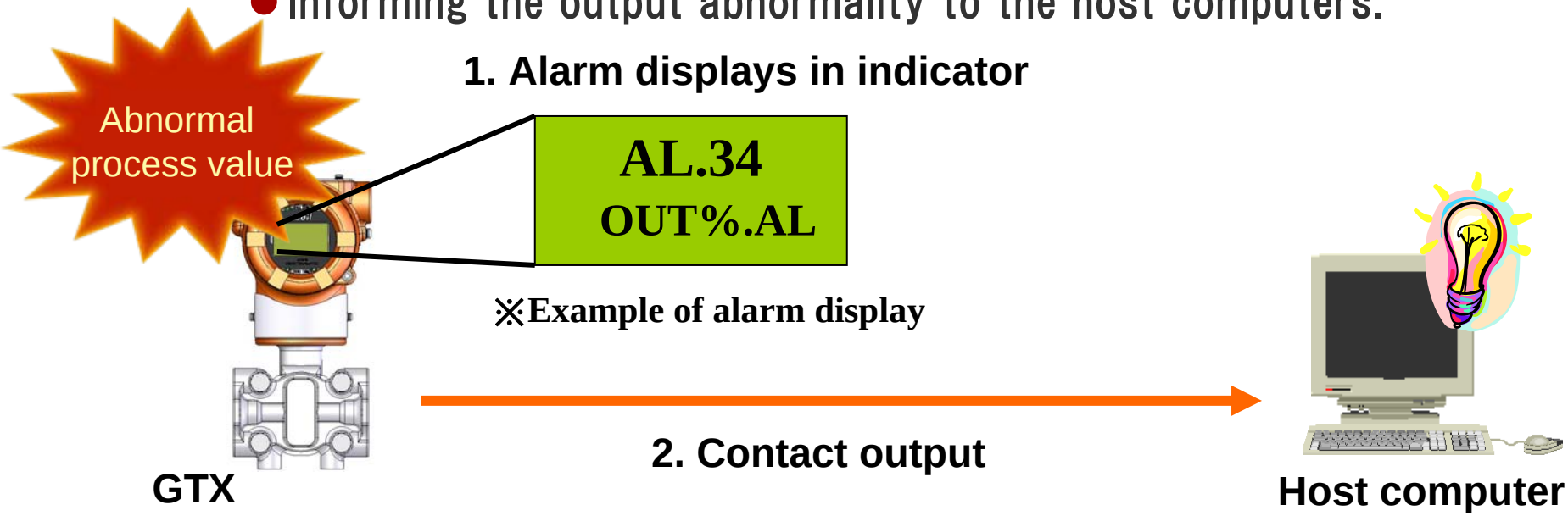
EDDL display



Trouble shooting

a. Alarm displays & contact output

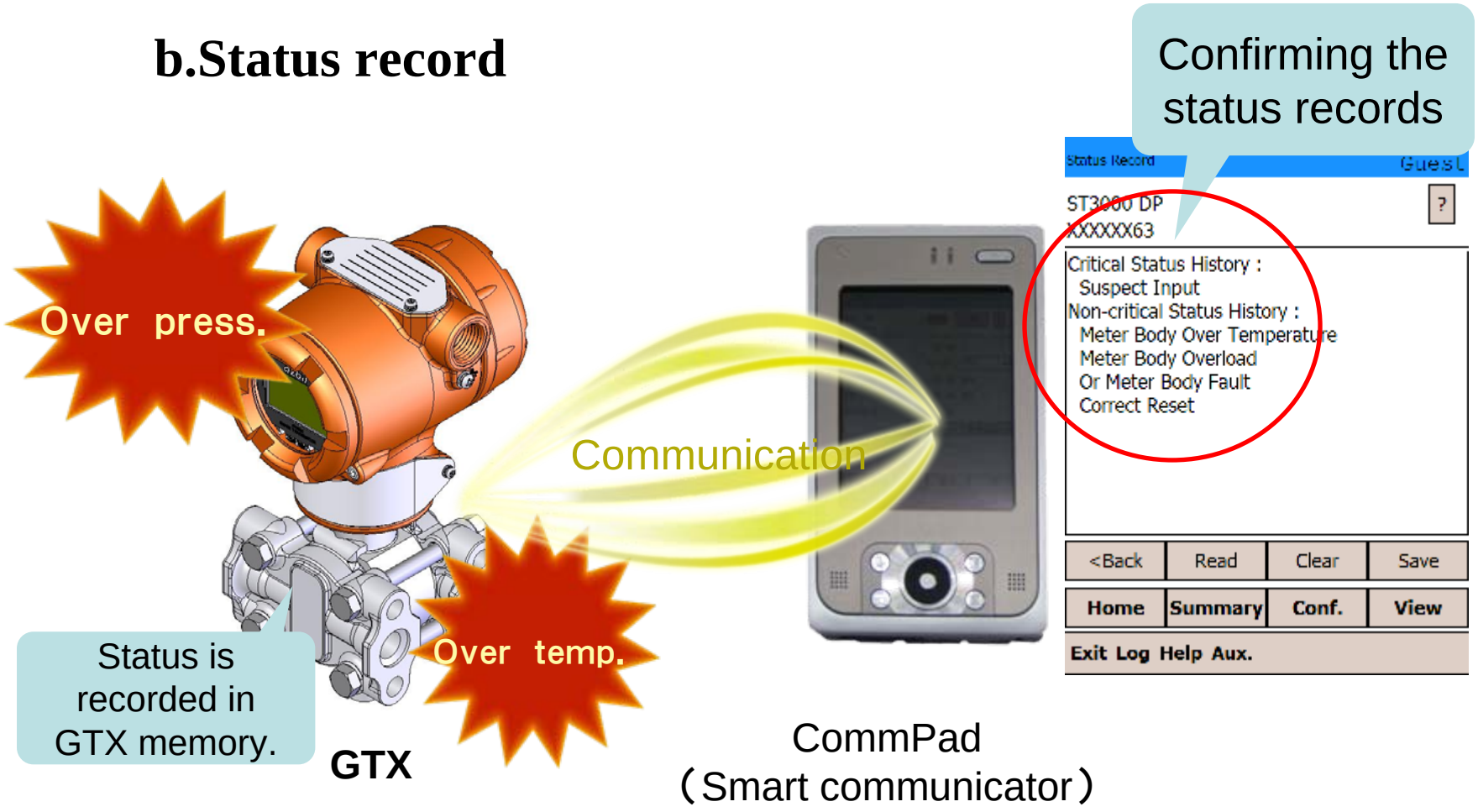
- In case of abnormal process value, give the early alarming information.
  - Confirming the alarm status displayed in the indicator.
  - Informing the output abnormality to the host computers.



Customer can detect the abnormal process value quickly

Trouble shooting

b.Status record



Using CommPad, customers can confirm the status in the past.

Comparison with S900

Series Name	ST9000 Model GTX	ST3000 Series 900
Model NO.	GTX31D	STD920
Sensor	NPS(Yamatake Original Sensor)	ED(Honeywell Sensor)
Measuring Span	0.5 to 100kPa {2 to 400 inchH2O}	0.75 to 100kPa {3 to 400 inchH2O}
Accuracy(Linear Output) Analog mode	+/-0.04% for X>10 +/-(0.008+0.032*10/x)% for X<10	±0.075% For X≥50kPa ±0.1% For 5kPa≤X<50kPa ±{0.025+0.075*5kPa/X)}% For X<5kPa
Zero Stability	+/- 0.1%/ 10years	+/- 0.1%/ 1year
Response time	below 100msec	Approx. 400msec
Indicator	5 digit, Eng. units indication	4.5 digit
Write protection	Standard (Hard switch, software)	Standard (Hard switch)
Contact output	Available in Option	Not available
Weight	Approx. 3.4kg	Approx. 4.1kg
Safety approvals	SIL2	Not available
Characterization data store	Characterization data in SPM (No need to change electrical board when you change MB)	Charactarization data in PROM that located on the main electrical board
Diagnostics	Self diagnostic	Self diagnostic
	Status record	Not available
	Zero drift recode	Not available

-Possibility to change meter body without electrical board.

AT9000 Model Summary

Type	S900 Model	AT9000 Model	Measuring Span	Max. Working Pressure
DP	STD910	GTX15D	0.1 to 2 KPas	210 KPas
	STD920	GTX31D	0.5 to 100 KPas	21 MPas
	NEW	GTX30D	0.5 to 100 KPas	3.5 MPas
	STD930	GTX41D	35 to 700 KPas	21 MPas
	NEW	GTX40D	35 to 700 KPas	3.5 MPas
	STD960	GTX71D	0.25 to 14MPas	21 MPas
	STD921	GTX32D	0.5 to 100 KPas	42 MPas
	STD931	GTX42D	35 to 700 KPas	42 MPas
	STD961	GTX72D	0.25 to 14MPas	42 MPas
GP	STG940	GTX60G	17.5 to 3500 Kpas	5250 KPas
	STG960	GTX71G	0.7 to 14 MPas	21 MPas
	STG980	GTX82G	0.7 to 42 MPas	42 MPas

AT9000 Model Summary

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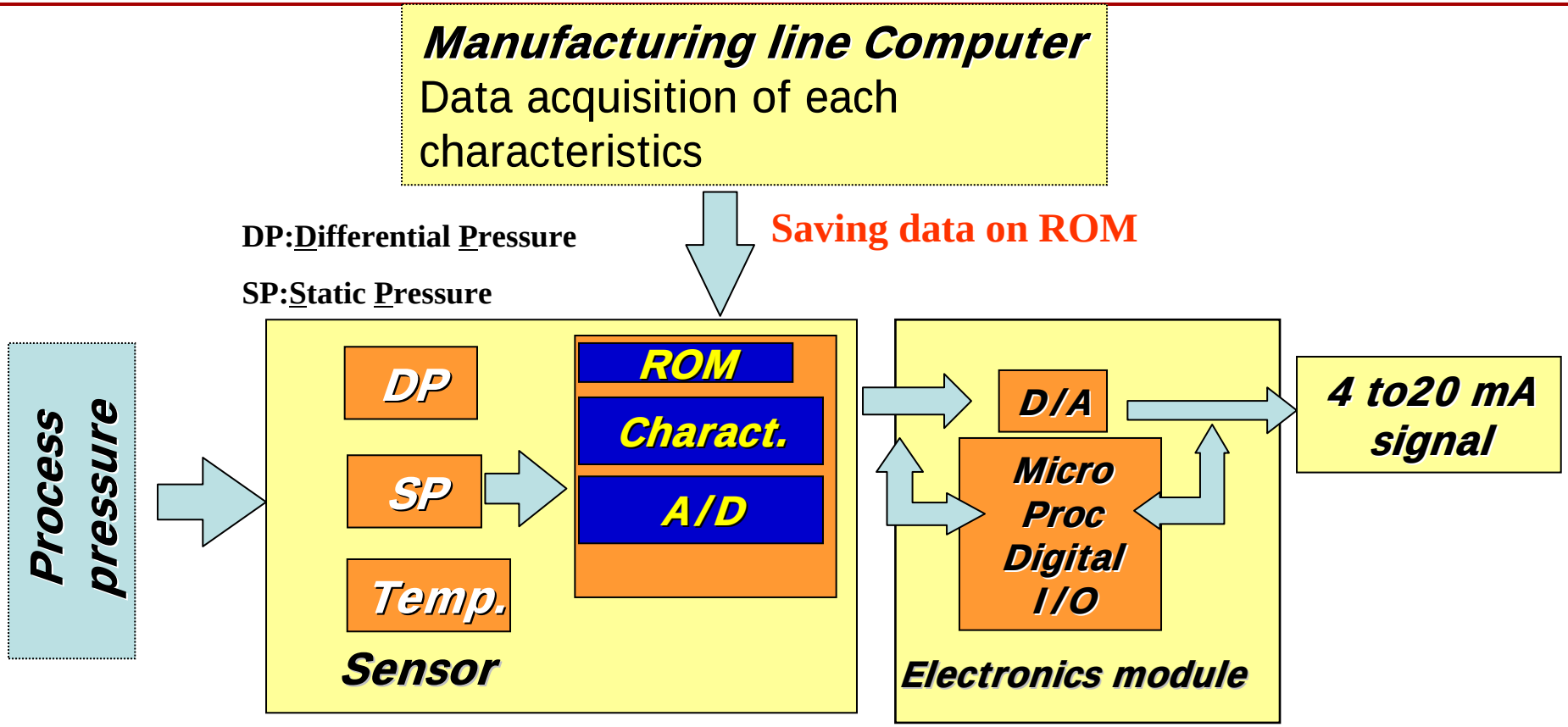
Type	S900 Model	AT9000 Model	Measuring Span	Max. Working Pressure
Flanged	STC929	GTX35F	2.5 to 100 KPas	Flange Dependent
	STC940	GTX60F	35 to 3500 KPas	Flange Dependent
AP	STA923	GTX30A	4 to 104 Kpas	300 KPas
	STA940	GTX60A	35 to 3500 KPas	5250 KPas
DP Remote	STE929	GTX35R	2.5 to 100 KPas	Flange Dependent
	STE930	GTX40R	35 to 700 KPas	Flange Dependent
GP Remote	STH920	GTX35U	2.5 to 100 KPas	Flange Dependent
	STH940	GTX60U	35 to 3500 KPas	Flange Dependent
	STH960	GTX71U	0.7 to 10 MPas	Flange Dependent
	STH980	GTX82U	0.7 to 42 MPas	Flange Dependent
AP Remote	STS922	GTX30S	4 to 104 Kpas	300 KPas
	STS940	GTX60S	35 to 3500 KPas	5250 KPas

Characterization

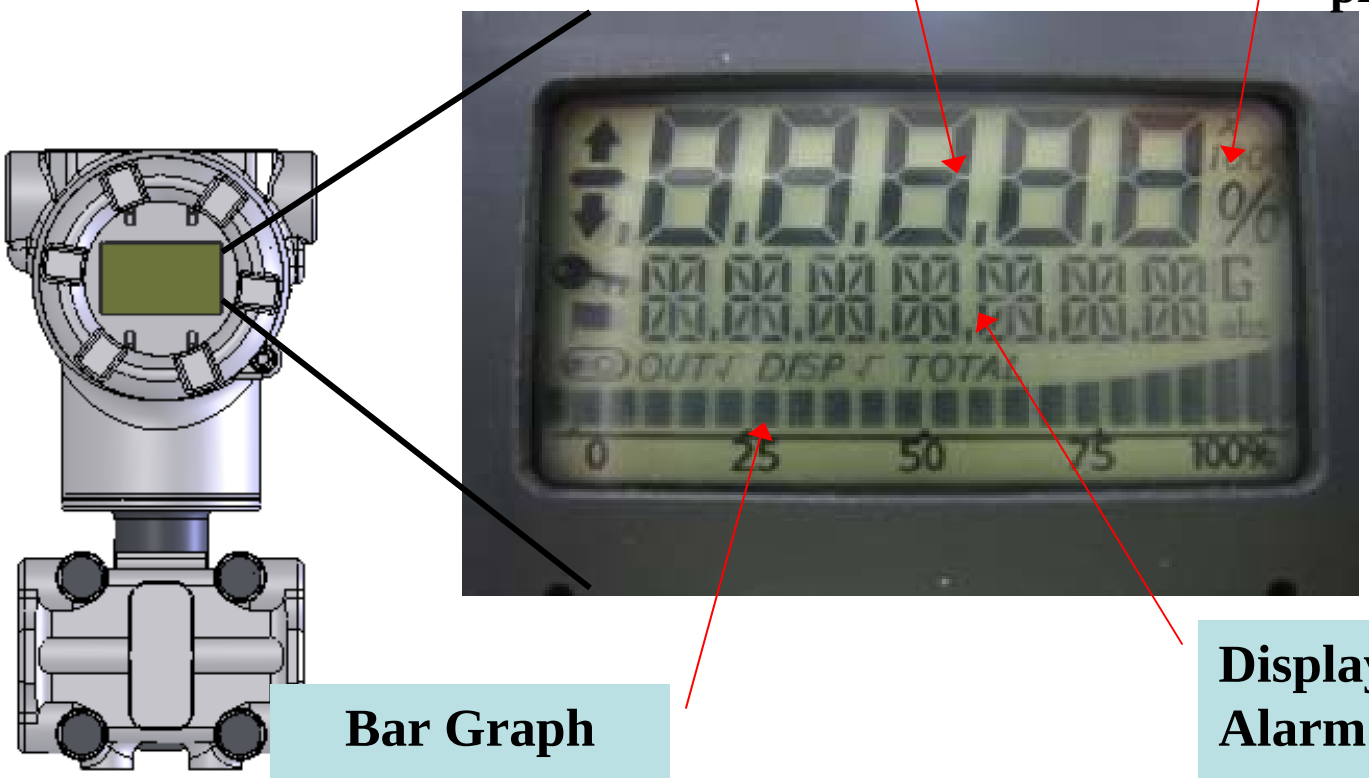


- GTX realized high accuracy and high stability owing to compensation called "Characterization."
- It enable to reduce the influence of ambient temperature and process pressure changes on GTX output.

High-performance indicator

PV：5 digits

%
G:Gage pressure
abs：Absolute pressure

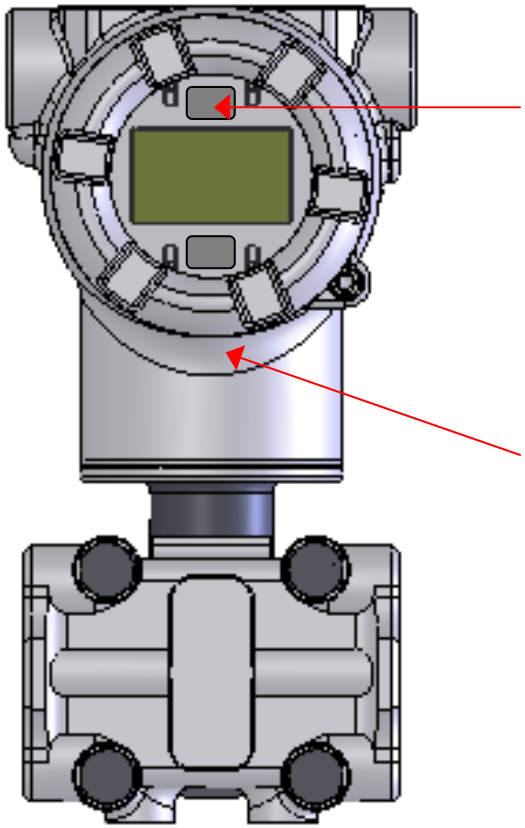


Bar Graph

Displays pressure unit/ Alarm status.

- Easily Viewable.
- Alarm status also can be confirmed

External zero/span adjustment switch



External span adjustment switch

External zero adjustment switch

Easy to adjustment to touch with magnetic stick without opening the case-cover.

Price List