COMMANDER
SR100A & SR100B

ABB Instrumentation
COMMANDER SR100A & SR100B

Technical Innovation

- Advanced print head design
  - Bi-directional printing
  - Rest position off page
  - Continuous trace or separate dots
- Robust door and catch system
  - IP65 / NEMA 3
  - Compact case design; 230mm (9in.) behind panel
- Universal inputs
- PC Configuration standard on all versions
- Basic and advanced versions
- Automatic Chart Rewind

ABB Instrumentation
<table>
<thead>
<tr>
<th></th>
<th>SR100B</th>
<th>SR100A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic</td>
<td>Basic applications</td>
<td>Advanced applications</td>
</tr>
<tr>
<td>applications</td>
<td>3- or 6-channel versions</td>
<td>1 to 6 channels available</td>
</tr>
<tr>
<td>Trace on</td>
<td>Trace on paper</td>
<td>Detailed chart print out</td>
</tr>
<tr>
<td>paper</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limited</td>
<td>Limited printing and scale formats</td>
<td>Data gathering</td>
</tr>
<tr>
<td>printing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>and scale</td>
<td></td>
<td>Data storage on PC card</td>
</tr>
<tr>
<td>formats</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature/process recording market</td>
<td></td>
<td>Recording with sequence and math requirement</td>
</tr>
</tbody>
</table>

ABB Instrumentation
# COMMANDER SR100

## Choice of Process Connections

<table>
<thead>
<tr>
<th></th>
<th>SR100B</th>
<th>SR100A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog Inputs</td>
<td>3 or 6</td>
<td>1 to 6</td>
</tr>
<tr>
<td>Transmitter PSU</td>
<td>3 loops – standard</td>
<td>3 loops – standard</td>
</tr>
<tr>
<td>Analog Outputs</td>
<td>–</td>
<td>12 optional</td>
</tr>
<tr>
<td>Relays</td>
<td>6 optional</td>
<td>12 optional</td>
</tr>
<tr>
<td>Digital Inputs</td>
<td>1 standard</td>
<td>1 standard, 12 optional</td>
</tr>
<tr>
<td>Digital Outputs</td>
<td>–</td>
<td>12 optional</td>
</tr>
</tbody>
</table>
COMMANDER SR100

Operations

ABB Instrumentation
COMMANDER SR100 – Operations
Universal 100mm Recorders

• High-clarity LCD display
  – Two-line alpha-numeric and bargraph
  – 2 x 20 character, long life, back-lit LCD
  – Different display formats

• Eight display frames available
  – Display in sequence
  – Automatically or Manually

ABB Instrumentation
COMMANDER SR100 – Operations
Universal 100mm Recorders

SR100 A
• Frame types
  – Pen value (Multi-display)
  – Digital values, including alarms
  – Totalizer + PV
  – Measured variable, channel no.
• Selectable lower frame line
  – Bargraph
  – Channel tag

SR100 B
• Frame types – Fixed format
  – Measured variable, channel no.
• Selectable lower frame line
  – Channel tag

ABB Instrumentation
COMMANDER SR100
Simple Operations

- Raise parameter value
- Lower parameter value
- Advance to next page or return to page header
- Advance to next parameter
- Lift/lower pen on alternate operation
- Store new value
COMMANDER SR100  
Flexible and Accurate

- Up to 12 universal inputs  
  - Type B, E, J, K, N, R, S, & T  
    Thermocouples, Pt100, mA, mV and V

- Programmable fault levels and actions  
  - Type B, E, J, K, N, R, S, & T  
    Thermocouples, Pt100, mA, mV and V

- 2-wire transmitter power supply  
  - 70mA at 24V (3 loops)

- Accuracy ±0.1%  
  - Clear and accurate recording

- Power supply  
  - 85 to 265V ac  
  - 10 to 30V dc  
  - 24V ac

ABB Instrumentation
COMMANDER SR100
Chart Trace

• One digital input as standard
  – Change chart speed, stop chart or alarm acknowledge

• Digital filter reduces the effect of noise

• Two configurable pen functions
  – Chart trace trend of analog inputs or math results
  – 3-position event marker (In, Off or Out)

• 6 programmable zones for event marking – SR100A only

Zones 1 to 6 each 16.6mm wide.
Events A and B represented by a 3mm shift from the centre line.
COMMANDER SR100

Chart

- Printed dots overlap giving a continuous, unbroken trace at chart speeds up to 500 mm/hr
- Message printing overlaps continuous traces at chart speeds of up to 120mm/hr
- At chart speeds of 120mm/hr and above, the trace is broken for text
- If new dot is more than a dot’s width from the last position, the pen is dropped and dragged to produce a trace

ABB Instrumentation
COMMANDE SR100

Easy to Use

- Roll or fanfold chart
  - Flexibility of customer choice
  - 25m (82ft) Roll Chart,
    12m (39ft) Fanfold Chart

- Automatic chart rewind
  - Simplifies chart changing

- Quick-fit pen cartridge
  - Changed in seconds

- Removable chart cassette
  - For easy chart replacement

- Instrument ranges the chart
  - Standard chart used, recorder adds
    ranges and scales to suit the
    application

ABB Instrumentation
COMMANDER SR100
Tough and Rugged

• Stainless steel case
  – Hard wearing, corrosion resistant

• Chemically-resistant polycarbonate door

• High security
  – Optional door lock

• IP65 / NEMA 3 front facia
  – Ideal for harsh environments, outdoors or indoors

ABB Instrumentation
COMMANDER SR100

Features

ABB Instrumentation
COMMANDER SR100B
Power without Complexity

• 3- or 6-point recorder
  – for basic ‘pen-on-paper’ applications

• Chart annotation as standard
  – makes chart record clear
  – time, date, chart speed, channel scales and alarm indication

• Can be supplied preconfigured and ‘ready to run’
COMMANDER SR100B
Analog Block Diagram

Inputs

6 Analog Inputs

Print or Display

Draw 6 Traces

Display all Analog Inputs (Scroll)
COMMANDER SR100B
Digital Block Diagram

Inputs
- 12 Process Alarms
- 1 Standard Digital Input
- 6 Input Failures
- Line Failure
- Chart Speed Status
- Paper Out

Outputs
- 6 Relays
- Chart Speeds
- Global Acknowledgement
- Scale Print

Analog Inputs
COMMANDER SR100B
Keep control of your process

• 12 Alarms available
  – High/Low process alarms with hysteresis
  – Can be allocated to relays or print alarm on chart

• Up to 6 relays can be fitted
  – Rated 5A 230V
COMMANDER SR100B

Chart Text...

End of Chart Warning –
last 2m (roll chart) or 1.5m (fanfold)

Channel Tag – every 240 mm

Time, Date & Chart Speed –
power-up and every 240 mm
COMMANDER SR100B

Chart Text…

**Time** – nearest hour or half hour after 60mm of trace

**Chart Scale** – 6 different scales; printed every 10mm to 240mm (programmable)
COMMANDE SR100B

Chart Text...

Change of Chart Speed

Process Alarms (Pa)

09:46 PaA

09:46 300mm/h

Time of Alarm

Alarm Type/Identifier

ABB Instrumentation
COMMANDER SR100B

Chart Text...

Trace Identifiers
COMMANDER SR100A

Simplicity with Power

- 1- to 6-point recorder
  - Advanced strip chart recorder

- 5 Display configurations
  - PV + Units + Bargraph; PV + Units + Channel Tag; PV + Units + Totalizer; Digital Signals; Multiple PV’s + Units

- Unique ‘Cue & Review’
  - Historical analysis of data while the chart is still in the recorder
  - Buffering of last ten alarms

- Full chart annotation
  - Alarm messages, batch number, totalizer print, value print, time, date, chart speed

ABB Instrumentation
COMMANDER SR100A
Analog Block Diagram

Inputs
- 6 Analog Inputs
- 6 Analog Inputs (Optional)
- 4 Math Blocks

Functions
- Print 12 Analog Values
- Display 2 Blocks of 8 Inputs (Auto-scroll)
- Display all Analog Inputs (Manual-scroll)
- Print and/or Display 6 Totalizers
- Draw 6 Traces

Print or Display

Outputs
- Modbus (RTU) Serial Communications
- PCMCIA Memory Card – up to 12 Channels
- 12 Analog Outputs

ABB Instrumentation
COMMANDER SR100A

Digital Block Diagram

Input Sources
- 12 Process Alarms
- 2 Real Time Events
- 6/12 Input Failures
- Line Failure
- Chart Speed Status
- Paper Out
- 12 Digital Inputs
- 1 Standard Digital Input

Functions
- 10 Logic Equations

Outputs
- 12 Relays
- 12 Digital Outputs
- 6 3-Position Event Pens
- Global Acknowledgement
- Totalizers Resets/Stop and Start
- Chart Speeds
- Printing
  - 1 Operator Message
  - 14 Digitally-triggered Message
  - 12 Alarm Messages
  - 2 Real Time Alarm Messages
  - 12 Channel Values
  - 12 Channel Data
  - 6 Scales
  - 6 Totalizers

ABB Instrumentation
COMMANDER SR100A

Interface with your process

• Configuration flexibility with internal soft-wiring
  – allocation of alarms internally without hard wiring

• 12 Alarms as standard
  – soft-wired to relays or logic equations

• Up to 12 relays for sequential process requirements
  – Rated 5A

• Up to 13 digital inputs
  – Soft-wired to logic equations, message print or chart control
  – 5V TTL or Volt-free

ABB Instrumentation
COMMANDER SR100A

Processing power

- 4 math blocks
  - Add, Subtract, Multiply, Divide, RH, Mass Flow, Low High and Median Select
- 6 Flow totalizers
- 10 logic equations
  - Input from alarms or digital inputs
  - AND and OR
- 2 real-time event timers
- 1 x 20-breakpoint linearizer
  - Ideal for non-linear tanks or special thermocouples
COMMANDER SR100A

Flexibility of Interfaces

• RS485 Modbus RTU
  – Available as an option for communication with control systems
  – 2- or 4-wire connections

• 12 analog retransmission outputs
  – Can be allocated to input signals or result of math blocks
COMMANDER SR100A
Memory Card...

- DOS-formatted for direct viewing on spreadsheet
- Recording of up to 12 channels
- Recording of process alarm states
- Date and time stamped
- Channel tags and units for each channel

ABB Instrumentation
COMMANDER SR100A

Memory Card

- PCMCIA memory card
  - Configuration storage
  - Data logging for simple interfacing with your PC
  - ‘Open System’ – transfer to MS Excel & Lotus 123 spreadsheets
  - Data logging – 640kb, 1Mb, 2Mb & 4Mb card capacities
  - Memory card logging capacity dependent on memory card size and scan time
- Scan rates from 1 to 240 seconds

Card Running Time (hrs) = \[
\frac{\text{scan interval (secs) x useable bytes}}{(13 + [\text{No. of channels} \times 7]) \times 3600}
\]

Where:
- Scan interval = 1 to 240 seconds
- Usable bytes = number of bytes usable for data logging – see Table
- No. of channels = 1 to 12

<table>
<thead>
<tr>
<th>Card Size</th>
<th>Usable Bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>64k</td>
<td>63,488</td>
</tr>
<tr>
<td>128k</td>
<td>129,024</td>
</tr>
<tr>
<td>256k</td>
<td>260,096</td>
</tr>
<tr>
<td>512k</td>
<td>521,216</td>
</tr>
<tr>
<td>1M</td>
<td>1,045,504</td>
</tr>
<tr>
<td>2M</td>
<td>2,092,032</td>
</tr>
<tr>
<td>4M</td>
<td>4,186,112</td>
</tr>
</tbody>
</table>
COMANDER SR100A

Chart Text...

End of Chart Warning –
last 2m (roll chart) or 1.5m (fanfold)

Channel Tag – every 240mm

Time, Date & Chart Speed –
power-up and every 240mm

Chart Scale – 6 different scales;
printed every 10mm to 240mm
(programmable)

ABB Instrumentation
**Commander SR100A**

**Chart Text...**

**Totalizer Values** – Printed at intervals between 5 and 720min; from a digital signal or from within the Print Messages Page

**Time** – nearest hour or half hour every 60mm of trace

**Channel Data** – engineering range and units, printed on demand from a digital signal or from within the Print Messages Page

---

**ABB Instrumentation**
### Process Alarms (Pa)

<table>
<thead>
<tr>
<th>Time</th>
<th>Alarm Type/Identifier</th>
<th>Message Assigned to Alarm</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:46</td>
<td>Rt1</td>
<td>Cleaning Complete</td>
</tr>
<tr>
<td>09:46</td>
<td>PaA</td>
<td>High Inlet Temp</td>
</tr>
</tbody>
</table>

### Real Time Alarms (Rt)

- 09:46 Cleaning Complete
- 09:46 PaA High Inlet Temp
- 09:50 Batch 18/3 Complete

### Change of Chart Speed

- 09:46 Rt1 Cleaning Complete
- 09:46 PaA High Inlet Temp
- 09:50 Batch 18/3 Complete

### Operator Message

- 09:46 Rt1 Cleaning Complete
- 09:46 PaA High Inlet Temp
- 09:50 Batch 18/3 Complete

---

**ABB Instrumentation**
Commander SR100A

Chart Text...

Channel Values – Printed at programmable time intervals (between 5 and 720 minutes), on demand from a digital signal or from within the Print Messages Page.

<table>
<thead>
<tr>
<th>Time</th>
<th>Channel</th>
<th>Measured Value</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:00</td>
<td>A1</td>
<td>75.5</td>
<td>%RH</td>
</tr>
<tr>
<td>09:00</td>
<td>A3</td>
<td>110.0</td>
<td>°C</td>
</tr>
<tr>
<td>09:00</td>
<td>A5</td>
<td>25.2</td>
<td>l/h</td>
</tr>
<tr>
<td>09:00</td>
<td>A2</td>
<td>495.8</td>
<td>m³/day</td>
</tr>
<tr>
<td>09:00</td>
<td>A4</td>
<td>20.0</td>
<td>CO₂</td>
</tr>
<tr>
<td>09:00</td>
<td>A6</td>
<td>7.0</td>
<td>pH</td>
</tr>
</tbody>
</table>

ABB Instrumentation
Trace Identifiers
Event Marker – Identified with either:
'<' – input A active, pen in
'>' – input B active, pen out

20 Character Message Block – up to 14 different messages can be printed on demand from a digital signal

08:00 Start Cleaning Cycle
COMMANDER SR100
PC Configuration with MS Windows

- Create configurations in minutes
- Save onto disk or memory card
- Print out hard copy
- Download to recorder
- All recorders have dedicated configuration ports
- Compatible with MS Windows 3.1, 95, 98 & NT
COMMANDER SR100

Application Features

ABB Instrumentation
COMMANDER SR100

Easy View

• Instant view of the latest trace and process conditions

Chart traces during normal operation (in Operating Page 1 or 2)

1. Operate the switch to activate Easy View

2. The chart advances approximately 30mm for 5 seconds and then rewinds to its original position and resumes recording

ABB Instrumentation
COMMANDER SR100A
Cue & View

- Post-incident and historic data review
- Last 10 process or real-time alarms buffered and available for review
- Advance/rewind facility
  - Review long term and monitored data

ABB Instrumentation
COMMANDER SR100A
Message Block Configuration

• 14 message blocks
  – 20 Characters
  – Colour Selectable
  – Time Stamped

• Block Print Sources
  – Total wrap
  – Paper out alarm
  – Input failure
  – Digital input
  – Chart speed
  – Logic equation
  – Power failure
  – Real time alarm
  – Process alarms

ABB Instrumentation
COMMANDER SR100A
Print Channel and Data Values

- Printing of up to 12 channel values
- Channel identity, value and engineering units for each channel

- Selectable printing trigger
  - Internal Digitals (Alarms)
  - External Digitals (Inputs)
  - Time Intervals (0 to 24 hours)
COMMANDER SR100A
Print Totalizer Values

- Printing
- Channel identity, value and engineering units for each channel
- Selectable printing trigger
  - Internal Digitals (Alarms)
  - External Digitals (Inputs)
  - Time Intervals
    (5 minutes to 24 hours)

<table>
<thead>
<tr>
<th>Time</th>
<th>Identity</th>
<th>Value</th>
<th>Totalizer Units</th>
<th>Totalizer Tag</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:28</td>
<td>T1</td>
<td>10903333</td>
<td>LITRES</td>
<td>Flow 1</td>
</tr>
<tr>
<td>11:28</td>
<td>T2</td>
<td>22702221</td>
<td>GALS</td>
<td>Flow 2</td>
</tr>
<tr>
<td>11:28</td>
<td>T3</td>
<td>30004434</td>
<td>m3</td>
<td>Flow 3</td>
</tr>
<tr>
<td>11:28</td>
<td>T4</td>
<td>44950394</td>
<td>LITRES</td>
<td>Flow 4</td>
</tr>
<tr>
<td>11:28</td>
<td>T5</td>
<td>59573487</td>
<td>GALS</td>
<td>Flow 5</td>
</tr>
</tbody>
</table>
COMMANDER SR100A

Math Blocks

• 4 Programmable math blocks

• 11 Standard math functions
  – RH
  – Mass Flow 1 & 2
  – (a x b) + c
  – (a – b)/c
  – (a + b)/c
  – (a x b) x c
  – (a + b + c)/3
  – (a + b + c)
  – Low Select
  – Med Select
  – High Select
  – F Value

• Programmable engineering units and result tag for each block

ABB Instrumentation
**COMMANDER SR100A**

**Math Block Example – Total Flow Calculation**

- Individual flow signals from the flowmeters in each pipe are recorded on separate channels.
- The total flow rate (in the common pipe) is calculated using a math block.
- Internal soft wiring is used to record the total flow rate on a fourth channel.
- Use the math result as an input to a totalizer to calculate the total flow quantities and hence the volume of liquid.
COMMANDER SR100A

Logic Equations...

- 10 programmable logic (Boolean) equations
- Up to 16 elements per equation
- Integration of both internal and external signals
  - Alarms
  - Digital inputs
  - Other logic equations
  - Real time alarms
- Initiation of instrument functions
  - Alarm acknowledgement
  - Pen events
  - Changes of chart speed
  - Value printing
  - Relay outputs
COMMANDER SR100A

Logic Equations

14 Different operands available:

* Terminator, used to complete the expression

) Close bracket

( Open bracket

& Logical AND

+ Logical OR

T1W – T6W Wrap-around of totalizer (T1 to T6)

P_O Paper Out alarm

FA1 – FB6 Input failure (A1 to A6, B1 to B6)

DA1 – DG3 Digital input active

CS1 – CS3 Chart speeds

L1 – L10 Logic equation true

PWR Power failure

RT1 – RT2 Real time alarm on (1 or 2)

PAA – PAM Predefined process alarm

(A to M excluding I)
COMMANDER SR100A

Logic Equation Example – Pump On/Off Control

- **Pump Running Conditions**
  - Low Level AND
  - time is between 8:00am and 5:00pm AND
  - no manual override

- **Input Elements**
  - Alarm A (PAA) set to Low Process Alarm with a trip of 1.8m and hysteresis of 0.2m
  - Real-time Alarm 1 (RT1) set on at 8:00am until 5:00pm
  - Digital input (DA1) set for positive logic so that when the switch is in Auto (normal operation) the input is active

- **Logic Equation**
  - $EQ01 = PAA \& RT1 \& DA1$
Logic Equation Example – Pump Control with Low Low Cutoff

- Operation as for previous Pump On/Off Control example, except that additional safety is now provided by a ‘Low-Low’ Alarm
- Alarm B set for Low-Low Process Alarm with a trip level of 1.4m
- Relay assigned to Logic Equation 2
- Logic Equations
  - EQ01 = PAA & RT1 & DA1
  - EQ02 = EQ01 or PAB
Logic Equation Example – Sequence Control

• Logic equations provide safety interlocks to prevent plant from being operated manually when certain process conditions are true.

• A chart recorder is monitoring dosing flows into a mixing tank.

• The chemicals in stream C must not be dosed at the same time as the chemicals in streams A and B.

• A relay is therefore required which prevents valve C from opening if valves A (DA1) or B (DB1) are open.

• Logic Equation: \( EQ01 = DA1 \) or \( DB1 \)

• Relay \( = EQ1 \)

ABB Instrumentation
COMMANDER SR100A
Custom Linearizer

- Single 20-point custom linearizer
- Variable spacing on X and Y axis to allow optimization of breakpoints

Select up to twenty breakpoints to create the curve required

% Non-Linear Input

ABB Instrumentation
COMMANDER SR100A
Real-time Alarms

- 2 programmable real-time events
- Programmable start and end dates/times
- Times are selectable for hour, day, month, year or a combination of any of these
COMMANDER SR100A

Real-time Alarm Example – print out a daily total and reset

- Real Time Alarm 1 (RTA1) set as follows:

<table>
<thead>
<tr>
<th>ON time</th>
<th>OFF time</th>
</tr>
</thead>
<tbody>
<tr>
<td>** Year</td>
<td>*** Month</td>
</tr>
<tr>
<td>** Day</td>
<td>**</td>
</tr>
<tr>
<td>00 Hour</td>
<td>00</td>
</tr>
<tr>
<td>00 Minutes</td>
<td>01</td>
</tr>
</tbody>
</table>

- Assign ‘Total 1 Print Source’ and ‘Total 1 Reset Source’ to RTA1

ON

1 minute on time

OFF

22:00 23:00 00:00 01:00 02:00
COMMANDE SR100A

Real-time Alarm Example – using two totalizers to log day and night flows

• Set RTA1 as follows:

<table>
<thead>
<tr>
<th>ON time</th>
<th>OFF time</th>
</tr>
</thead>
<tbody>
<tr>
<td>** Year</td>
<td>**</td>
</tr>
<tr>
<td>*** Month</td>
<td>***</td>
</tr>
<tr>
<td>** Day</td>
<td>**</td>
</tr>
<tr>
<td>06</td>
<td>18</td>
</tr>
<tr>
<td>00</td>
<td>00</td>
</tr>
</tbody>
</table>

Assign Total 1 Stop/Go Source to RTA1 for total daytime flow and Total 1 Print Source to RTA2

• Set RTA2 as follows:

<table>
<thead>
<tr>
<th>ON time</th>
<th>OFF time</th>
</tr>
</thead>
<tbody>
<tr>
<td>** Year</td>
<td>**</td>
</tr>
<tr>
<td>*** Month</td>
<td>***</td>
</tr>
<tr>
<td>** Day</td>
<td>**</td>
</tr>
<tr>
<td>18</td>
<td>06</td>
</tr>
<tr>
<td>00</td>
<td>00</td>
</tr>
</tbody>
</table>

Assign Total 2 Stop/Go Source to RTA2 for total night time flow and Total 2 Print Source to RTA1

• RTA1 ON is used to print the night flow total and RTA2 ON the day flow total
COMMANDER SR100A  
Totalizer Functions...

- Six digital totalizers available assignable to any channel or math results
- Count up or down
- Count Pulse
  - Used to energize relays or digital outputs
- Wrap Pulse
  - Used to energize relays or digital outputs

15480970
COMMANDER SR100A

Totalizer Functions

- Programmable present and predetermined count values for batch totals
- Adjustable cut-off values
- Operator level reset and stop/go
- Digital signal reset and stop/go
COMMANDER SR100A
Message Printing

- **Start Cheesecake** (Digital Input DB1)
- **Start Meringue** (Digital Input DB2)
- **Batch Complete** (Digital Input DB3)

**Message Printing**

- DB2 High = 'Print Message 2'
- DB3 High = Print Message 3 and channel values
- Alarm A active = Print Message 4
- DB1 high = Print Message 1
- DB1 OR DB2 high = Print scales
- Print 'blank'
- Operator Message to give date and time

- **10:04** Meringue Start
- **10:01** Batch Complete
- **10:01** A1 192°C, A2 51°C
- **09:55** Oven temp high
- **09:15** Cheesecake Start
- **09:00** 11-NOV-99
- **09:00** 11-NOV-99

ABB Instrumentation
COMMANDER SR100A

Deviation Alarms

- Differential of two process variables can be recorded as a single channel
- Maths blocks used to calculate differential alarm from and/or record this value

Channel 1 – Process variable input
Channel 2 – Reference value (Used to measure the deviation)
Channel 3 – The resultant deviation
COMMANDER SR100A

Average Value Printout

- Printout of a signal averaged over a set period
- Achieved by using combination of real-time alarms and totalizer

ABB Instrumentation
COMMANDER SR100

F Value...

- Four independent F Value calculations for sterilizing cycle applications
- User configurable variables
- Internal and external digital start and end calculation signals
- Sample time of 720ms resulting in an accuracy of <2%

ABB Instrumentation
F Value

\[ F_{\text{value}}(t) = F_{\text{value}}(t - 1) + \left( \frac{10^{(T_o - T_t)}}{Z} \right) \left( \frac{60}{\text{sample rate}} \right) \]

Where:

- \( F_{\text{value}}(t) \) = current Fvalue sum
- \( F_{\text{value}}(t - 1) \) = Fvalue sum at last sample
- \( T_o \) = measured temperature
- \( T_t \) = target sterilizing temperature
- \( Z \) = temperature interval representing a factor of 10 reduction in killing efficiency (Z factor)
- Sample Rate = 0.48 seconds
COMMANDER SR100

Remote Chart Speed Selection

• Where continuous recording of measured variables is not required, a digital input can be used to switch recording on and off or change chart speed

• Set Up:
  – Connect a ‘normally open’ volt-free signal to a digital input on the recorder
  – Set chart speed 1 to 0mm/hr; chart speed 2 to the speed required.
  – Allocate chart speed 2 source to the appropriate digital input; chart speed 1 source to ‘Chart Speed 2’.
  – When more than one chart speed source is active, the higher numbered source gets priority

ABB Instrumentation
Application Examples
COMMANDER SR100A & B

Effluent Flow

- Monitoring and recording of Flow, pH and Temperature

ABB Instrumentation
COMMANIDER SR100A & B
Package Boilers

- Multiple process point monitoring including:
  - Oxygen
  - Temperature
  - Level
  - Flows
COMMANDER SR100
Sterilizer Validation and Periodic Tests

• Thermometric tests to monitor and record temperature and pressure readings

ABB Instrumentation
COMMANIDER SR100

Tank Farms

- Monitoring and Recording of Temperature and Level
Kiln Waste Gases

- Monitoring and Recording of Gas and Temperature:
  - CO
  - O₂
  - NO
  - CO₂
COMMANDER SR100

Autoclaves/Retorts

- Batch Monitoring of Temperature and Pressure

ABB Instrumentation
COMMANDER SR100
Clean in Place

- Monitoring and recording of caustic solutions – temperature and flow
COMMANDER SR100
Cold Storage

- Multizone/room temperature monitoring and recording

Temperature Sensors (individual cable runs to the SR100 Recorder to ensure accuracy and profile of store)

ABB Instrumentation
COMMANDER SR100

Tobacco Leaf Processing

• Monitoring and recording of multiple zones temperature and moisture
COMMANDER SR100

Summary

SR100B
- Basic applications
- 3- or 6-channel versions
- Trace on paper
- Limited printing and scale formats
- Temperature/process recording market

SR100A
- Advanced applications
- 1 to 6 channels available
- Detailed chart print out
- Data gathering
- Data storage on PC card
- Recording with sequence and math requirement