AL4000 series is a hybrid recorder which employs bright and clear, easy to view LCD display. Measuring value display is prepared as 1 point display, multi-points simultaneous display and digital display + bar graph display. Various measuring and recording settings can be easily done by front key switch and confirmed by LCD digital display.

### FEATURES

- **Corresponds to SD card**
  Equipped with SD card (sold separately) and it can record data, read and write setting value.

- **Full multi range**
  Equipped with DC voltage 10 kinds, T/C 36 kinds, RTD 12 kinds, in total 58 kinds. Easily set the range per channels.

- **Easy data management by communication interface**
  Provided with USB port and connect with PC directly. RS232C, RS422A, RS485 and Ethernet communication interface is optionally prepared. When Ethernet is selected, settings from the web and E-mail alarm notification are added.

- **Package Software attached**
  By Data acquisition software, the use of application expands from recording/management to information processing.
  *Optional communication interface required.

  Data analysis software can replay display, wave process, editing and trend display. Parameter setting software can manage the setting information on PC.

- **Standard alarm display/ Printing function**
  Set 4 types of alarm per each input points. When alarm occurs, status display “ALM” flashes and measuring value flashes at LCD operation screen.

- **Chart end detection function available**
  Can set the alarm operation when chart end is detected.

- **Various programming function**
  Process the measured data by programming setting and displayed/recorded data of each channels are shown as programmed result data.

- **SD card playback function (option)**
  By replaying the saved data files in SD card, you can record or printing back to the chart paper.

### MODELS

<table>
<thead>
<tr>
<th>AL47</th>
<th>06</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input point</td>
<td>06 : 6 points</td>
<td></td>
</tr>
</tbody>
</table>

- **Communication interface (option)**
  N : None
  E : Ethernet
  R : RS232C
  A : RS422A/RS485
  Q : RS232C+RS485
  C : RS422A/RS485+RS485
  G : Ethernet + RS422A/RS485+RS485
  F : Ethernet + RS422A/RS485+RS485

- **Alarm output / remote contacts (option)**
  0 : None
  2 : Mechanical relay 2 points (’a’ contact)
  4 : Mechanical relay 4 points (’c’ contact) + remote contact 5 points
  A : Mechanical relay 6 points (’a’ contact) + remote contact 5 points

- **Power supply**
  A : 100-240V AC

- **Carrying handle and feet (option)**
  N: None
  T: With carrying handle and feet

- **For OP/SP**
  N: None
  P: SD card playback
AL4000 SERIES

NAME

1. Graphic LCD display

Display measured data by digital display and analog indication by bar graph display.

- **1 point display**
  ![1 point display]

- **1 point display + bar graph display**
  ![1 point display + bar graph display]

- **6 points simultaneous display**
  ![6 points simultaneous display]

2. Front key switch

Setting contents can be easily registered by front key switch.

3. SD card slot

Save measured data to SD card by designated interval (Fastest 6 points: 1sec). Also, register measuring / recording condition such as range, scale, chart speed and when required, set the unit by registered conditions.

By using optional playback function you can perform the trace printing, digital recording / printing on the chart paper replaying the saved data files.

4. Prepare engineering port at the front

Connect with PC by mini-USB cable*. By attached setting software, you can set or change the parameter by PC.

*Purchase commercialized product separately.

5. White LED chart illumination

Set ON/OFF/AUTO (OFF after no operation for 3 minutes).
**RECORDING EXAMPLE**

**Periodic data printing**
Record the data over trace printing by arbitrary interval.

**List printing**
Print setting data such as range, scale, etc. for each channel.

**Data print**
When the latest data is required, trace printing will stop and record.

**Alarm printing**
When alarm activates/reset, prints time, channel no., alarm type and alarm no.

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**SD card playback function (option)**
By replaying the saved data files in SD card, you can record or printing back to the chart paper. It can reply even if the chart paper data is lost due to paper jam or no recording ink.
**INPUT SPECIFICATIONS**

- **Measuring points:** 6
- **Input types:**
  - DC voltage: ±13.8mV, ±27.6mV, ±69.0mV, ±200mV, ±500mV, ±1V
  - ±5V, ±10V, ±20V, ±50V
  - DC current: Max 50mA by external shunt resistor (100Ω, 250Ω)
- **Thermocouple:**
  - K, E, J, T, S, B, N, U, L, W-Re26, WR-6-WRe26, PtRh40-PtRh20, NiMo-Ni, Cr-AuFe, Platine II, Au/Pt
  - Resistance thermometer: Pt100, old Pt100, JP100, Pt50, Pt-Co
- **Accuracy ratings:** Refer to the table of measuring range/accuracy ratings/display resolution
- **Measuring interval:** 1 second / 6 points
- **Input resolution:** About 1/40,000 or better (converted to Measuring interval: 1 second / 6 points)
- **Accuracy ratings:** Refer to the table of measuring range/accuracy ratings/display resolution
- **Reference junction compensation accuracy:**
  - ±0.5°C or EMF 20µV, whichever greater
- **Burnout:**
  - Burnout detection function for thermocouple input and RTD input. Upper burnout, lower burnout or burnout disabled is selectable for each input.
- **Maximum common mode voltage:** 30V AC/60V DC
- **Common mode rejection ratio:**
  - 50dB or more (50/60Hz)
  - 130dB or more (50/60Hz)
- **Normal mode rejection ratio:**
  - 30V AC/60V DC
- **Terminal board:** Removable when wiring.

**DISPLAY SPECIFICATIONS**

- **Analog display:** LCD bar graph 100mm
- **Digital display:**
  - Monographic type LCD (Backlight: AUTO / Always ON settable)
- **Dots:** 240 x 48 dots
- **Display area:** 106 x 16mm
- **Display item:** All channels simultaneous display, year/month/day, hour/minute, alarm activate channel, chart speed display of measuring value.
- **Status display:** REC, CARD, ALM

**ALARM DISPLAY**

- **Alarm display:** Status display "ALM" flash, measuring value flash at operation screen
- **Alarm types:**
  - Absolute alarm, differential alarm, rate-of-change alarm, FAIL, calendar timer, chart end.
- **Alarm settings:**
  - Individual settings, Max 4 levels/channel
- **Alarm output:**
  - Mechanical relay 2 or 6 points ('a' contact)
  - Mechanical relay 4 points ('c' contact)

**STANDARDS**

- **CE marking:** EN61326-1
  - EN61010-1
  - *Under EMC test condition, variation in indication value is ±20% or ±2mV at maximum, whichever is larger.
- **UL:** UL61010-1 2nd edition
- **CSA (C-UL):** CAN/CSA C22.2 No.61010-1
- **Protection:** IEC 60529 IP54

**RECORDING SPECIFICATIONS**

- **Dotting interval:** 5 seconds/point, 2.5 seconds/point
- **Interlock to chart speed**
- **Recording method:** Wire-dot type 6-color ribbon
- **Record/Printed color:**
  - Channel no. 1: Red, Black, Blue
  - Channel no. 4: Green, Brown, Purple
- **Digital recording:**
  - Periodic data printing: Repetition of red, black, blue, green, brown and purple
  - Alarm printing: Activate: Red, Reset: Green
  - List printing: Black (channel each items color are same as trace printing color)

- **Chart paper:** Fan-fold type
  - Total width 114mm, total length 10m, effective chart width 100mm
- **Chart speed:** 1 to 1500mm / h, in 1mm/h increments (12.5mm / h can be set exceptionally)
- **Periodic data printing:**
  - Digital printing is added to trace printing at month / day, time, channel no., data, unit Interval (hour/time) arbitrary setting.
- **Data printing:**
  - When required, interrupt trace printing and digital print time and measuring value.
  - Alarm printing: Alarm activated --- Time, channel no., alarm type and level
  - Alarm reset --- Time, channel no., alarm level
- **Memory capacity --- Max. 48 data**
- **List printing:**
  - When required, interrupt trace printing and print date, chart speed and setting information of each channel.
- **Message printing:**
  - Print when required
  - Up to 15 characters/message, register up to 20 characters.
- **ON/OFF of display and recording:**
  - Select ON / OFF of display per each channel, trace recording to chart, digital recording to SD card
- **Subtract printing:**
  - Record difference between reference channel and measuring value or between reference value (set value) and measuring value.
- **Zone printing:**
  - 2 divisions
- **Compressed/Expanded printing:**
  - Range limit is made non-linear and specific chart recording lower/upper limit is shrunk or expanded.
- **Automatic range shift printing:**
  - Recording range is shifted automatically to another set range when measured value exceeds the current range. Overlap function available.
- **Skip function:**
  - No display or printing of channels of which ranges are not set.

**CONNECTIVITY**

- **Web browser**
  - SD card slot
- **Application**
  - Server: FTP server
- **Ethernet**
  - RS422A / RS485 *Option
- **SD card**
  - USB port for PC
- **PLC**
  - KP
- **DB**
  - LT

**DBKPPLC LT**

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4
**GENERAL SPECIFICATIONS**

- **Rated power voltage:** 
  100 to 240VAC, 50/60Hz
- **Maximum power consumption:** 
  Max. 40VA 
  100V AC balanced: 20VA 
  240V AC balanced: 27VA
- **Normal operation condition:** 
  Ambient temperature range: 0 to 50ºC (20 to 65%) 
  Ambient humidity range: 20 to 80%RH (5 to 40ºC) 
  Power voltage: 90 to 264V AC 
  Power frequency: 50/60Hz ±2%
- **Altitude:** 
  Forward tiltting 0º, backward tiltting 0 to 30º, left/right 0 to 10º

**Case material:** 
- Door: Aluminum die-casting
- Front panel: Glass

**Case color:** 
- Door: Black (equivalent of Munsell N3.0) 
- Glass: Clear and colorless 
- Case: Gray (equivalent of Munsell N7.0)

**Mounting:** Panel mounting

**Weight:** About 3.0kg

**Terminal screw:** 
- Power terminal, Protective conductor terminal — M4.0
- Measuring input terminal, alarm output terminal — M3.5
- Communication terminal — M3.0

**OPTIONS**

- **Remote contact:** 
  By external relay contact signal (digital contact: short or open), you can select chart speed or data printing
  - Input points: 5 points
  - Input signal: Digital contact signal or open collector signal

- **Exterior output:** 5V DC/2mA Function: 
  1. Record start/stop 
  2. Chart speed 3-speed switch 
  3. Data printing 
  4. List printing 
  5. Message printing 
  6. Operation record (Record ON/OFF condition to the designate location by bar line) 
  7. Integration/F value reset 
  8. Memory card (record start/stop) 
  9. Alarm output reset 
  10. Time correction

- **Alarm output:** 
  Mechanical relay (‘a’ contact) 2 points, 6 points 
  Max. load 100 to 240VAC 0.2A 
  30V DC 0.2A 
  Min. load 5V DC 10mA

- **Mechanical relay (‘c’ contact) 4 points 
  Max. load 100 to 240VAC 0.2A 
  30V DC 0.2A 
  Min. load 5V DC 10mA

- **Communication interface:** 
  RS232C, RS422A, RS485, Ethernet

- **Low order communication:** 
  This instrument functions as host unit and reads data from the units* connected as low order unit complying with the set parameter content. The data is to be displayed and recorded as host unit data. Use COM2 port (RS485) to connect with the low order units.
  To write the measured/calculated data of this instrument to the low order unit (PLC) is also available.

*CHINO products and some of PLC (MELSEC, YAMAHA, EATON, ...)

- **SD card playback:** 
  This function is to perform trace recording of measured value, digital recording/printing of time, time line and maximum/minimum chart record, etc. on the chart paper by using the data files of measured values saved in SD card.
  To perform the playback/record/printing, select desired files and specify a time range. Digital printing is to be performed every 0.05mm as chart is fed, if any measured value data exists in the equivalent time scale.

**ACCESSORIES**

<table>
<thead>
<tr>
<th>Model</th>
<th>SD Card</th>
</tr>
</thead>
<tbody>
<tr>
<td>RZ-SMC512</td>
<td>512MB</td>
</tr>
<tr>
<td>RZ-SMC1G</td>
<td>1GB</td>
</tr>
<tr>
<td>RZ-SMC2G</td>
<td>2GB</td>
</tr>
</tbody>
</table>
### TERMINAL ARRANGEMENT

#### Alarm relay output (6 points ‘a’ contact) + remote contacts and communication interface

<table>
<thead>
<tr>
<th>Communication terminal</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM1</td>
<td>RS232C</td>
<td>SG</td>
<td>SD</td>
<td>RD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM2</td>
<td>RS422A</td>
<td>SG</td>
<td>SA</td>
<td>SB</td>
<td>RS485</td>
<td>SA</td>
<td>SB</td>
<td>SG</td>
</tr>
</tbody>
</table>

* RS232C and RS422A/485 are specified on purchase.

#### Alarm relay output (4 points ‘c’ contact) + remote contacts and communication interface

<table>
<thead>
<tr>
<th>Communication terminal</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
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<td>SA</td>
<td>SB</td>
<td>RS485</td>
<td>SA</td>
<td>SB</td>
<td>SG</td>
</tr>
</tbody>
</table>

* RS232C and RS422A/485 are specified on purchase.

#### DIMENSIONS

**Panel cutout**

*Max 216, When alarm output/remote contacts unit and communication unit are added*

### APPLICATION SOFTWARE (standard attached)

**Data Acquisition Software**

You can acquire data easily to your PC.

*Optional communication interface required*

**Parameter Setting Software**

Control the setting information at PC by using communication interface or USB port (standard equipped)

**Data Analysis Software**

Open the binary file recorded in the SD card, replay display and edit the trend of acquired data file.

**Specifications subject to change without notice. Printed in Japan (J) 2017. 3**

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