

**Model 3701 / 3702  
LR8100E / LR12000E Recorder  
/ REM**

IM 3701 - 50E

IM 3701 - 50E  
3rd Edition

# Product Registration

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# 1. GENERAL

## 1.1 Outline

Remote control (/REM) is an optional function for the LR8100/LR12000 recorder.

This optional function enables chart start/stop, chart speed control, chart speed change, pen up/down, RECORD ON/OFF, message and manual printout to be executed via a remote control signal.

When the IC memory card is used, an external trigger signal can be input.

FAIL and CHART END outputs are also provided for.

## 1.2 Specifications

### Chart start / stop

- Function : Chart feed start and stop  
 Signal level : Start with L (SHORT) and stop with H (OPEN)  
 Input signal : TTL, Open collector, contact (the same applies to the following functions).

### Chart speed change

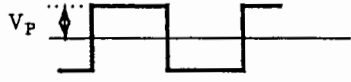
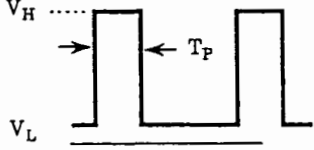
- Function : Speed 1 and 2 can be transferred.  
 Signal level : Speed 2 with L (SHORT), Speed 1 with H (OPEN)

### Manual print

- Function : Prints time and measured data  
 Signal level : Manual print with L (SHORT)

### Chart speed control

- Function : Chart speed is remote controlled.

Waveform	Sine, triangular, rectangular waves	Pulse train
Signal level	 $4\text{v} < V_p < 24\text{V}$	 $+4\text{v} < V_H < +24\text{V}$ $-24\text{V} < V_L < +0.5\text{V}$ $T_p > 300\mu\text{s}$
Max. signal source impedance	600Ω	50Ω
Chart speed	0.15 fcm / min ( f = frequency )	
Max. frequency	LR8100 : 800 Hz LR12000 : 400 Hz	LR8100 : 800 pps LR12000 : 400 pps

### Message printout

- Function : Time and message (up to 70 characters, 4 points)  
 Signal level : Using L (SHORT) prints a message

### Pen lift

- Function : All pens are lifted or lowered at the same time.  
 Signal level : All pens are lowered with L (SHORT) and lifted with H (OPEN).

### Record ON/OFF

- Function : Transferred between RECORD ON (measurement and recording) and OFF (measurement)  
 Signal level : OFF with L (SHORT), ON with H (OPEN)

### External trigger

- Function : Starts writing memory function (option)  
 Signal level : Starts writing with L (SHORT)

### Others

- : FAIL and chart END alarm outputs



### CAUTION

The maximum input voltage to the external input terminal must not exceed the -24V to 24V range. If voltages which exceed these values are applied, the circuit might be damaged.

### Accessories

- : Connector (50 pins)  
 AMPHENOL 57-30500, parts number A 1006 JD

## 2. OPERATION

### 2.1 Remote Function Setting

When using this function, the following must be initially set in the SET UP mode.

#### 2.1.1 Setting Item and Function

Setting item	Function	Description
REMOTE CTR	ON/OFF setting.	Always set ON when using this function.
CHART SPD 2	ON/OFF setting.	Second speed ON/OFF used when chart speed is altered.
CHART CLOCK	INT/EXT setting.	Settable whether chart is fed by internal (INT) signal or by external (EXT) signal.

**Note:** Even when REMOTE CTRL is set ON, setting from the front panel is possible.

## 2.1.2 Setting

### Setting Example

- (1) REMOTE CTRL : ON
- (2) CHART SPD2 : ON
- (3) CHART CLOCK : EXT

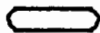
#### Setting SET UP mode

When the power of the unit is turned OFF, switch ON the SET UP switch, located on the rear panel, and then turn ON the power, while pressing the ENTRY key.

(Key operation)

(Setting panel)

(Description)

  
F4

```

SET UP

↓ UNIT PRN RCD RMT

↓ COM RJC OTHR
  
```

Press F4 key to set  
REMOTE setting mode.

  
F1

```

REMOTE CTRL : OFF

ON OFF
  
```

Press F1 key to set  
REMOTE function ON.

  
F1

```

REMOTE CTRL : ON
CHART SPD2 : ON
CHART CLOCK : INT

ON OFF
  
```

Press F1 key for second  
chart speed.



F2

```
REMOTE CTRL : ON
CHART SPD2 : ON
CHART CLOCK : INT
```

INT EXT

Press F2 key to set chart speed to external input (EXT).



ENTRY



ENTRY

```
REMOTE CTRL : ON
CHART SPD2 : ON
CHART CLOCK : EXT
```

Press ENTRY key when the above is completed. SET UP menu will be displayed when the key is pressed once, normal start-up status will be displayed when the key is pressed a second time. Setting is completed.



## 2.2 Usage

### 2.2.1 Connector Pin Arrangement

Remote control connectors (50 pins) are located on the rear panel of the unit.

The following shows each functions connector pin arrangement.

Pin No	Function	Pin No	Function
1		26	
2	NO	27	NO
3	C   CHART END	28	C   FAIL
4	NC	29	NC
5		30	
6	Message 1	31*	COM
7	Message 2	32*	COM
8	Message 3	33*	COM
9	Message 4	34*	COM
10	RECORD ON/OFF 1 Pen	35	COM
11	RECORD ON/OFF 2 Pen	36	COM
12	RECORD ON/OFF 3 Pen	37	COM
13	RECORD ON/OFF 4 Pen	38	COM
14	RECORD ON/OFF 5 Pen	39	COM
15	RECORD ON/OFF 6 Pen	40	COM
16	RECORD ON/OFF 7 Pen	41	COM
17	RECORD ON/OFF 8 Pen	42	COM
18	Pen up/down	43	COM
19	Chart start/stop	44	COM
20	Chart speed change	45	COM
21	Manual print	46	COM
22		47	COM
23	External trigger	48	COM
24	Chart speed control	49	COM
25	Remote function ON/OFF	50	COM

\* In case of the LR12000, the functions are as follows :

Pin No	Function
31	RECORD ON/OFF 9 Pen
32	RECORD ON/OFF 10 Pen
33	RECORD ON/OFF 11 Pen
34	RECORD ON/OFF 12 Pen

### CAUTION

Function ON/OFF contact, excepting chart speed control and external triggering, are executed every second (every 125 ms in case of LR12000). Therefore, when ON/OFF contacts are repeated for short periods of time, change may not be detected.

## 2.2.2 Remote Function ON/OFF

### (1) Function

To use /REM options, turn ON remote signal (see table below).

### (2) Connection

Input signal	ON	OFF	Connection
contact signal	short-circuited	open	Pin No. 25 and LR8100 : any pin from No. 31 to 50 LR12000 : any pin from No. 35 to 50
TTL signal open collector	L level	H level	

## 2.2.3 Chart Start/Stop

### (1) Function

Starts/stops chart feeding.

### (2) Connection

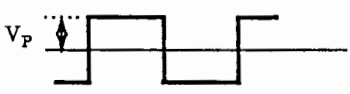
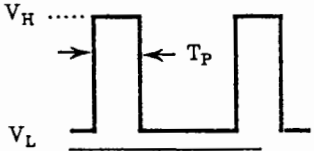
Input signal	Start	Stop	Connection
contact signal	short-circuited	open	Pin No. 19 and LR8100 : any pin from No. 31 to 50 LR12000 : any pin from No. 35 to 50
TTL signal open collector	L level	H level	

## 2.2.4 Chart Speed Control

### (1) Function

Chart feed speed is controlled using remote signals.

Input specifications are as follows.

Waveform	Sine, triangular, rectangular waves	Pulse train
Signal level	 $4v < V_p < 24V$	 $+4v < V_H < +24V$ $-24V < V_L < +0.5V$ $T_P > 300\mu s$
Max. signal source impedance	600Ω	50Ω
Chart speed	0.15 fcm / min ( f = frequency )	
Max. frequency	LR8100 : 800 Hz LR12000 : 400 Hz	LR8100 : 800 pps LR12000 : 400 pps

(2) Connection Input above signals into Pin No. 24 and any pin between No. 31 to 50.

## 2.2.5 Chart Speed Change

### (1) Function

Transfers chart speed 1 and 2.

In this case, CHART SPD2 must be ON in SET UP mode and speed 2 must be in the chart speed setting.

### (2) Connection

Input signal	Speed 2	Speed 1	Connection
contact signal	short-circuited	open	Pin No. 20 and LR8100 : any pin from No. 31 to 50 LR12000 : any pin from No. 35 to 50
TTL signal open collector	L level	H level	

## 2.2.6 Pen Up/Down

### (1) Function

All pens are lifted or lowered together.

When an individual pen is to be lifted/lowered, connect the control signal to RECORD ON/OFF (Section 2.2.7).

### (2) Connection

Input signal	Down	Up	Connection
contact signal	short-circuited	open	Pin No. 18 and LR8100 : any pin from No. 31 to 50 LR12000 : any pin from No. 35 to 50
TTL signal open collector	L level	H level	

## 2.2.7 RECORD ON/OFF

### (1) Function

Record ON/OFF for each channel selectable.

Measurement and display continues in the OFF mode. The pen shifts to the right and is lifted automatically.

### (2) Connection

Input signal	OFF	ON	Connection
contact signal	short-circuited	open	LR8100 : one pin from No. 10 to 17 and one from No. 31 to 50 LR12000 : one pin from No. 10 to 17 or from No. 31 to 34 and one pin from No. 35 to 50
TTL signal open collector	L level	H level	

## 2.2.8 Message Printout

### (1) Function

Prints out any one of four (4) messages that are registered at any time.

### (2) Connection

Input signal	ON	Connection
contact signal	short-circuited	One pin between No. 6 to 9 and LR8100 : any pin from No. 31 to 50
TTL signal open collector	L level	LR12000 : any pin from No. 35 to 50

## 2.2.9 Manual Print

### (1) Function

Data measured on all channels are printed at the time of their registration.

### (2) Connection

Input signal	ON	Connection
contact signal	short-circuited	Pin No. 21 and LR8100 : any pin from No. 31 to 50
TTL signal open collector	L level	LR12000 : any pin from No. 35 to 50

## 2.2.10 Remote trigger (when IC memory card is used)

### (1) Function

Writing start (START) signal is triggered when the optional IC memory card (378904, 378905, 378906) is used.

### (2) Connection

Input signal	Start	Connection
contact signal	short-circuited	Pin No. 23 and any one between pin No. 31 to 50
TTL signal open collector	L level	

### Notes :

1. Writing cannot be stopped while in progress.
2. The remote trigger monitors data once every sampling period.

## 2.2.11 CHART END, FAIL Output

### (1) Function

CHART END: Relay contact is output when the chart ends.

FAIL: Relay contact is output when internal CPU is abnormal.

Contact capacity: 24 V AC, 1A

### (2) Connection

Pin No	Function	Pin No	Function
1		26	
2	NO	27	NO
3	C	28	C
4	NC	29	NC
5		30	
	CHART END		FAIL