

**/ REM for  
LR4100E, LR4200E Series  
Recorders**

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# 1. GENERAL

## 1.1 Outline

Remote control (/REM) is an optional function for the LR4100 and LR4200 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.

(Only Model LR4110 and LR4210 has pen up/down, message print, and manual print functions.)

When 256kB IC Memory Card (3789 04) is added, an external signal can be input.

## 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 :

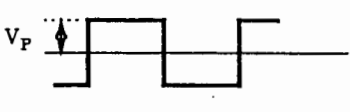
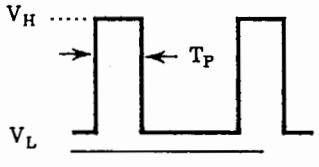
- Function : Speed 1 and 2 can be transferred.  
 Signal level : Speed 2 with L (SHORT), Speed 1 with H (OPEN)

### Manual print (Only for Model LR4110 and LR4210) :

- 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	 <p style="text-align: center;"><math>4v &lt; V_p &lt; 24V</math></p>	 <p style="text-align: center;"> <math>+4v &lt; V_H &lt; +24V</math>  <math>-24V &lt; V_L &lt; +0.5V</math>  <math>T_P &gt; 300\mu s</math> </p>
Max. signal source impedance	600Ω	50Ω
Chart speed	0.15 fcm / min ( f = frequency )	
Max. frequency	800 Hz	800 pps

### Message printout (Only for Model LR4110 and LR4210) :

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

### Pen lift (Only for Model LR4110 and LR4210) :

- 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)

**Chart Reroll Start/Stop (LR 4200 only) :**

**Function** : Chart Reroll starts and stop when /Reroll is added.

**Signal level** : Starts with L (SHORT) and stop with H (OPEN)

**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 57-30360, parts number A 9026 KC

## 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 depressing 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.



## [Key operation]

## [Setting panel]

## [Description]



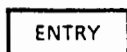
```

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

```

INT EXT
  
```

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



```

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

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

## 2.2 Usage

### 2.2.1 Connector Pin Arrangement

Remote control connectors (36 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	Message 1	19	COM
2	Message 2	20	COM
3	Message 3	21	COM
4	Message 4	22	COM
5	RECORD ON/OFF 1 Pen	23	COM
6	RECORD ON/OFF 2 Pen	24	COM
7	RECORD ON/OFF 3 Pen	25	COM
8	RECORD ON/OFF 4 Pen	26	COM
9	NC	27	COM
10	NC	28	COM
11	Pen up/down	29	COM
12	Chart start/stop	30	COM
13	Chart speed change	31	COM
14	Manual print	32	COM
15	Chart Reroll start/stop	33	COM
16	External trigger	34	COM
17	Chart speed control	35	COM
18	Remote function ON/OFF	36	COM

### CAUTION

Function ON / OFF contact, excepting chart speed control and external triggering, are executed everysecond. 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. 18 and any pin between No. 19 to 36.
TTL signal open collector	L level	H level	

## 2.2.3 Chart Start/Stop

### (1) Function

Starts/stops chart feeding.

### (2) Connection

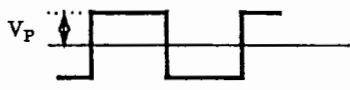
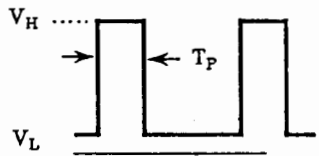
Input Signal	Start	Stop	Connection
contact signal	short-circuited	open	Pin No. 12 and any pin between No. 19 to 36.
TTL signal open collector	L level	H level	

## 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	800 Hz	800 pps

(2) Connection Input above signals into Pin No. 17 and any pin between No. 19 to 36.

## 2.2.5 Chart Speed Control

### (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. 13 and any pin between No. 19 to 36.
TTL signal open collector	L level	H level	

## 2.2.6 Pen Up/Down (only for LR4110 and LR4210)

### (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. 11 and any pin between No. 19 to 36.
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	One pin between No. 5 to 8 and one between No. 19 to 36
TTL signal open collector	L level	H level	

### 2.2.8 Message Printout (Only for LR4110 and LR4210)

#### (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. 1 to 4 and one between No. 19 to 36
TTL signal open collector	L level	

### 2.2.9 Manual Print (Only for LR4110 and LR4210)

#### (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. 14 and any one between pin No. 36 to 50
TTL signal open collector	L level	

### 2.2.10 Remote trigger (when IC Memory Card 3789 04 is used)

#### (1) Function

Writing start (START) signal is triggered when the optional 256KB IC memory card (3789 04) is used.

#### (2) Connection

Input Signal	Start	Connection
contact signal	short-circuited	Pin No. 16 and any one between pin No. 19 to 36
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. Therefore, if the contact point turns ON and back OFF again within the same sampling period, the trigger will not be detected.

**2.2.11 Chart Reroll Start/ Stop (Only for LR 4200)****(1) Function**

start /stop chart reroll.

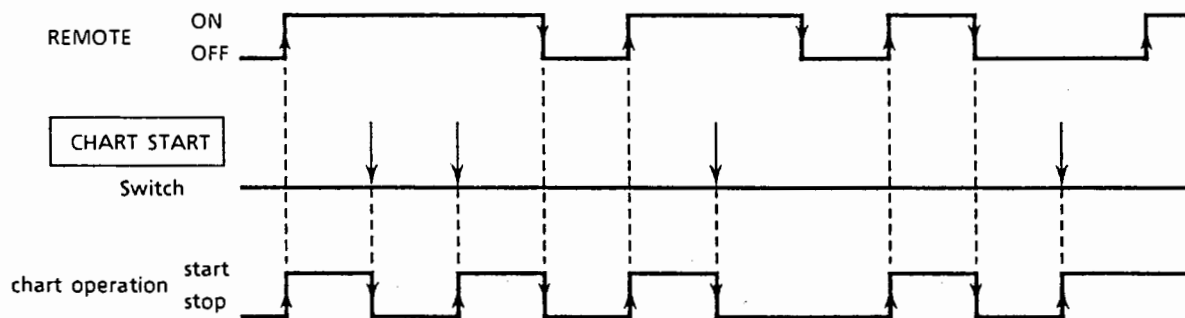
**(2) Connection**

Input Signal	Start	Stop	Connection
contact signal	short-circuited	Open	Pin No. 15 and any pin between No. 19 to 36
TTL signal open collector	L level	H level	

## 2.3 Contact Action

### 2.3.1 Contact Actions for Chart Start/Stop, Pen UP/Down, and RECORD ON/OFF

For example, when chart start/stop contact changes OFF position to ON position, chart start is put into operation. Chart start/stop can also be executed by a remote contact signal. While the chart start is in operation, if the **CHART START** is pressed, chart feeding can be stopped even though the chart start contact remains closed. The panel operation has priority over the contact status. To restart the chart with a remote signal, turn OFF and then ON the remote contact. While the chart feeding is stopped, even though a remote contact changes to chart stop status, operation is not changed. While the chart is feeding, even though a remote contact changes to the chart start status, operation is no longer changed.



#### [When the Power Turns ON]

when the power turns ON with the contact ON (closed), the recorder is in closed - contact operation. IF the power is turned ON with the contact OFF (open), the recorder is in no longer operation.

(When the power tuerns ON, the recorser assumes that the contact starts is OFF (open) position.)

#### CAUTION

- (1) With the chart start / stop contact in ON (closed) position, when the chart feeding is stopped by operation the front panel, and the power is turned OFF and ON, the chart is in start status.
- (2) With the chart start / stop contact in OFF (open) position, when the chart feeding is started, and the power turns OFF and ON, the recorder is in chart start status when a battery is installed.

## **2.3.2 Chart Speed Change and Control**

### **(1) Chart Speed Change**

Contact status changes chart speed.

### **(2) Chart Speed Control**

When the remote input contact is OFF (open), the chart speed is automatically changed from EXT to INT, allowing you to set the chart speed locally.

## **2.3.3 Remote Trigger (TRIG ALARM, TRIG CHART, and TRIG RMT)**

A remote trigger signal is monitored every sample period (at 5 - second intervals when the memory card sample period is set to 0.2 Hz). During this period, if a remote contact changes from OFF to ON to OFF position, it cannot be recognized as a trigger signal.

## **2.3.4 Other Contact Input Signals**

When the contact changes from OFF (open) to ON (closed) position, the functions shown below will work.

- (1) Message print
- (2) Manual print
- (3) Remote trigger
- (4) Chart Reroll