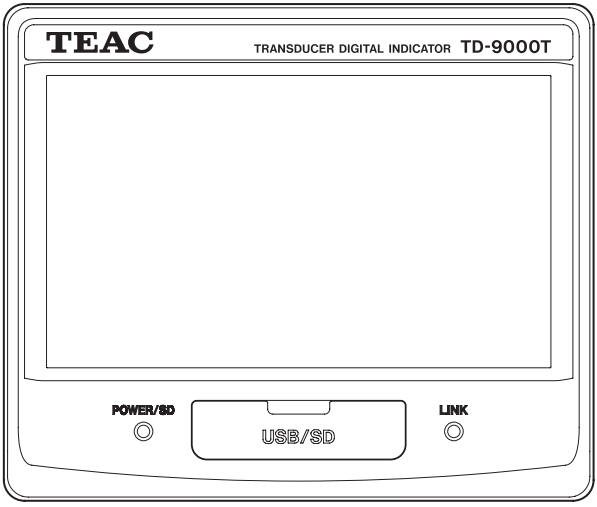
D01399405C

TEAC

CC-Link Instructions for Use

TD-9000T(CCL)

CC-Link



Introduction

Thank you for purchasing the TD-9000T (CCL) Digital Indicator. Please read this manual and the manual for the main unit completely before using them to get the best performance and ensure safe and proper operation.

For information about CC-Link communications, refer to dedicated documents about it, for example.

Included accessories

If anything is missing or damaged, contact us. (For contact information, see the last page.)

- CC-Link connector plug 1
  - 35A05-60S0-B0M GF or equivalent part
- Ferrite core 1
  - SFT-59SNB or equivalent part

Disclaimers

Information is given about products in this manual only for the purpose of example and does not indicate any guarantees against infringements of third-party intellectual property rights and other rights related to them. TEAC Corporation will bear no responsibility for infringements on third-party intellectual property rights or their occurrence because of the use of these products.

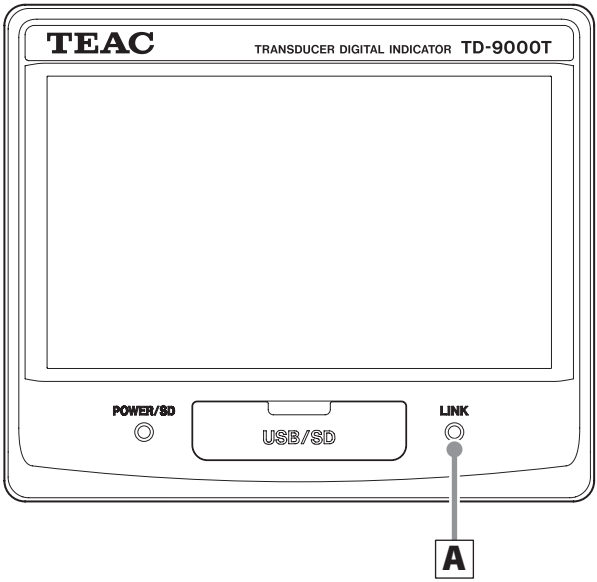
ATTENTION

CC-Link and USB/RS232C can be used for transmission with this unit. When using CC-Link for control, however, discontinue control by USB/RS232C, and when using USB/RS232C for control, discontinue control by CC-Link. Operation cannot be guaranteed when controlled by both at the same time.

Contents

1. Names and functions of parts

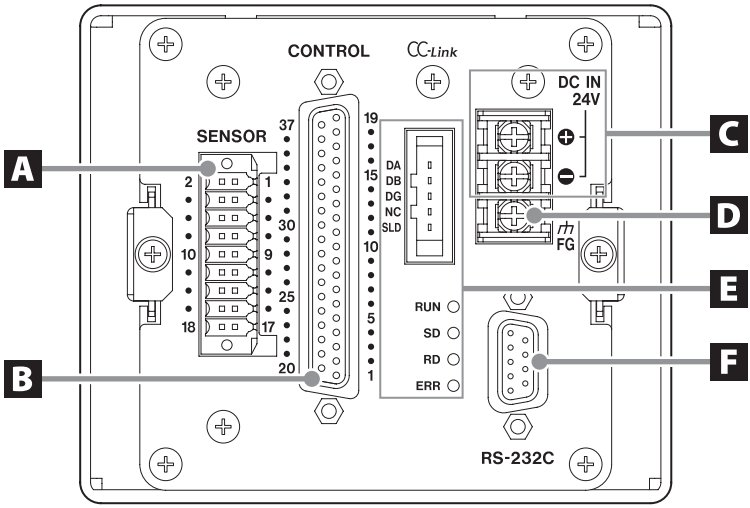
1-1. Front



A **LINK indicator**

Unlit: Network not connected (link to network not established)
Blinking: Transmission error
Lit: Refreshing and polling

1-2. Back



A SENSOR connector

Insert the included sensor connector plug here.

B CONTROL connector

C DC power supply input terminals

Connect a DC power supply.
The voltage range is DC 24 V ±10%.

D FG (frame grounding) terminal

Frame grounding terminal for DC power supply.

⚠ **Always be sure to connect the frame grounding terminal.**

E CC-Link

Connector

Signal	Wire color
DA	Blue
DB	White
DG	Yellow
NC	
SLD	Connection line (shielded)

- The wire color is the color of the insulation used by the CC-Link cable.

Indicators

RUN
- Unlit: Network not connected or transmission error occurred (invalid carrier, timeout, etc.)
- Lit: After network joined, refreshing and polling received normally

SD
- Unlit: No transmission
- Lit: Transmitting

RD
- Unlit: Carrier detection failed
- Lit: Carrier detected

ERR
- Unlit: Normal transmission
- Lit: CRC error or device setting error
- Blinking: Setting changed while linked

F RS-232C connector

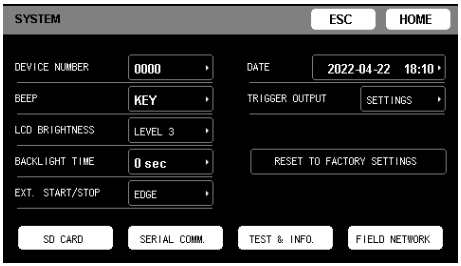
2. Communication functions

2-1. Field network

2-1-1. Settings

To open the FIELD NETWORK screen, touch the buttons in the following order on the Home Screen.

⚙ ➡ CALIB. & SYSTEM ➡ SYSTEM ➡ FIELD NETWORK



CONTROL INPUT

Select the device control method.
Only one method can be used for control.
Control terminal: Use external contact.
COMM. (Communication control): Use communication.

MEMORY CONTROL

Select the sensor number and work switching method.
FORBID: Use control input signals.
ALLOW: Use communication.
(Work switching is only enabled when work switching is set to external input in the work settings.)

CC-Link

CC-Link settings

2-2. CC-Link

2-2-1. Settings

To open the CC-Link screen, touch the buttons in the following order on the Home Screen.

⚙ ➡ CALIB. & SYSTEM ➡ SYSTEM ➡ FIELD NETWORK ➡ SETTINGS (next to "CC-Link")

OCCUPIED STATIONS

Set the number of CC-Link occupied stations.
The maximum station number is 63 when two stations are occupied and 61 when four stations are occupied.

STATION NUMBER

This can be set between 1 and 63. Consider the number of occupied stations, and set this so that it does not overlap with other stations.

TRANSMISSION SPEED

Set the CC-Link transmission speed. The maximum transmission distance changes according to the transmission speed.

NOTE

Transmission speed	Maximum transmission distance
156 kbps	1200 m
625 kbps	900 m
2.5 Mbps	400 m
5 Mbps	160 m
10 Mbps	100 m

ATTENTION

Restart the power after changing CC-Link settings.

3-1. CC-Link overview

Version

Ver. 1.10

Station type

Remote device station

3-2. Connections

3-2-1. Connecting to the CC-Link connector

A 2-piece type connector is used.
Insert the included CC-Link connector plug into the CC-Link connector.
When wiring the CC-Link connector plug, press the button for each pin while inserting the wire.

3-2-2. Connecting the CC-Link terminals

- We recommend the following rod terminal specifications.
  Terminal diameter: Ø1.05 – 1.15 mm
  Terminal length: Metal part of terminal should be at least 9 mm
  Material: Copper
  Surface finish: metal-plated
- Use CC-Link specialty cables to make connections.
  Connect the shield to the SLD connector.
- Pass the connection cable through the ferrite core (SFT-59SNB) before use. Connect the ferrite core to the TD-9000T (CCL) end.
- If a TD-9000T (CCL) will be the unit at both ends, connect terminators to both DA and DB.
- Always disconnect the power before working with wiring.
- Refer to the Install Guide issued by the CC-Link Partner Association.

ATTENTION

- Connect the included CC-Link connector plug to the CC-Link connector. Do not connect any connector plug other than one included because doing so could make it unsafe.

3-3. Address map

3-3-1. Remote registers with 4 stations occupied (pages 0–2)

Real-time page (page 0)

Station	TD-9000T (CCL) ➡ Master station				Master station ➡ TD-9000T (CCL)			
	Remote input	Address	Name		Remote output	Address	Name	Area
1	RWr0000	0x2E0	Real-time value	Load value	RWw0000	0x1E0	High high limit (HH)	Exclusive
	RWr0001	0x2E1		Displacement value	RWw0001	0x1E1	High limit (HI)	
	RWr0002	0x2E2	Peak load value		RWw0002	0x1E2	Low limit (LO)	
	RWr0003	0x2E3	Bottom load value		RWw0003	0x1E3	Low low limit (LL)	
2	RWr0004	0x2E4	OK count		RWw0004	0x1E4	Digital offset	
	RWr0005	0x2E5	NG count		RWw0005	0x1E5		
	RWr0006	0x2E6			RWw0006	0x1E6		
	RWr0007	0x2E7			RWw0007	0x1E7		
3	RWr0008	0x2E8	Number of recorded waveforms		RWw0008	0x1E8		
	RWr0009	0x2E9	Sensor number		RWw0009	0x1E9		
	RWr000A	0x2EA	Work number		RWw000A	0x1EA		
	RWr000B	0x2EB			RWw000B	0x1EB		
4	RWr000C	0x2EC	Command data		RWw000C	0x1EC	Command data	Common
	RWr000D	0x2ED			RWw000D	0x1ED		
	RWr000E	0x2EE	Command No.		RWw000E	0x1EE	Command No.	
	RWr000F	0x2EF	Error code		RWw000F	0x1EF		

Results page (page 1)

Station	TD-9000T (CCL) ➡ Master station				Master station ➡ TD-9000T (CCL)			
	Remote input	Address	Name		Remote output	Address	Name	Area
1	RWr0000	0x2E0	Band	Load value	RWw0000	0x1E0		Exclusive
	RWr0001	0x2E1		Displacement value	RWw0001	0x1E1		
	RWr0002	0x2E2	Zone 1	Load value	RWw0002	0x1E2		
	RWr0003	0x2E3		Displacement value	RWw0003	0x1E3		
2	RWr0004	0x2E4	Zone 2	Load value	RWw0004	0x1E4		
	RWr0005	0x2E5		Displacement value	RWw0005	0x1E5		
	RWr0006	0x2E6	Zone 3	Load value	RWw0006	0x1E6		
	RWr0007	0x2E7		Displacement value	RWw0007	0x1E7		
3	RWr0008	0x2E8	Zone 4	Load value	RWw0008	0x1E8		
	RWr0009	0x2E9		Displacement value	RWw0009	0x1E9		
	RWr000A	0x2EA	Zone 5	Load value	RWw000A	0x1EA		
	RWr000B	0x2EB		Displacement value	RWw000B	0x1EB		
4	RWr000C	0x2EC	Command data		RWw000C	0x1EC	Command data	Common
	RWr000D	0x2ED			RWw000D	0x1ED		
	RWr000E	0x2EE	Command No.		RWw000E	0x1EE	Command No.	
	RWr000F	0x2EF	Error code		RWw000F	0x1EF		

Waveform page (page 2)

Station	TD-9000T (CCL) ➡ Master station			Master station ➡ TD-9000T (CCL)			
	Remote input	Address	Name	Remote output	Address	Name	Area
1	RWr0000	0x2E0	Waveform data (n)/ Band start position	RWw0000	0x1E0	Band waveform data (n)/ Band start position	Exclusive
	RWr0001	0x2E1	Waveform data (n+1)/ Band end position	RWw0001	0x1E1	Band waveform data (n+1)/ Band end position	
	RWr0002	0x2E2	Waveform data (n+2)	RWw0002	0x1E2	Band waveform data (n+2)	
	RWr0003	0x2E3	Waveform data (n+3)	RWw0003	0x1E3	Band waveform data (n+3)	
2	RWr0004	0x2E4	Waveform data (n+4)	RWw0004	0x1E4	Band waveform data (n+4)	
	RWr0005	0x2E5	Waveform data (n+5)	RWw0005	0x1E5	Band waveform data (n+5)	
	RWr0006	0x2E6	Waveform data (n+6)	RWw0006	0x1E6	Band waveform data (n+6)	
	RWr0007	0x2E7	Waveform data (n+7)	RWw0007	0x1E7	Band waveform data (n+7)	
3	RWr0008	0x2E8	Waveform data (n+8)	RWw0008	0x1E8	Band waveform data (n+8)	
	RWr0009	0x2E9	Waveform data (n+9)	RWw0009	0x1E9	Band waveform data (n+9)	
	RWr000A	0x2EA	Offset (response n)	RWw000A	0x1EA	Offset* (n=0–2230)	Control
	RWr000B	0x2EB	Control (response)	RWw000B	0x1EB	Control (waveform selection)	
4	RWr000C	0x2EC	Command data	RWw000C	0x1EC	Command data	Common
	RWr000D	0x2ED		RWw000D	0x1ED		
	RWr000E	0x2EE	Command No.	RWw000E	0x1EE	Command No.	
	RWr000F	0x2EF	Error code	RWw000F	0x1EF		

*Offset

This sets the 10-word waveform data start position shown in the exclusive area with an offset value.

Waveform data is shown in a 0–2239 range, so set this within that range.

Control (waveform selection)

Bit	15 (MSB)	14	13	12	11	10	9	8
Name								Band start/stop
Bit	7	6	5	4	3	2	1	0 (LSB)
Name					Band waveform (H)	Band waveform (L)	Displacement waveform	Load waveform

- Only set one bit to 1.

ATTENTION

Remote input on the waveform page is always being updated. Read or write waveform data, only when in a STOP or CONTINUE state.

3-3-2. Remote I/O with 4 stations occupied

Station	TD-9000T (CCL) ➡ Master station				Master station ➡ TD-9000T (CCL)		
	Remote input	Address	Name		Remote output	Address	Name
1	RX0000	0x0E0	Exclusive area response		RY0000	0x160	Exclusive area request
	RX0001				RY0001		
	RX0002		Common area response		RY0002		Common area request
	RX0003		R/W (response)		RY0003		R/W (request)
	RX0004		RWr page selection (response) (page: 0–4)		RY0004		RWr page selection (page: 0–4)
	RX0005				RY0005		
	RX0006		CPU operating properly		RY0006		
	RX0007		Decimal point position 1 (load)		RY0007		
	RX0008		Decimal point position 2 (load)		RY0008		
	RX0009		Decimal point position 3 (load)		RY0009		
	RX000A		Decimal point position 1 (displacement)		RY000A		
	RX000B		Decimal point position 2 (displacement)		RY000B		
	RX000C		Decimal point position 3 (displacement)		RY000C		
	RX000D				RY000D		
	RX000E		Trigger output 1		RY000E		
	RX000F		Trigger output 2		RY000F		
	RX0010	0x0E1	Load judgments (continuous/ results)	High high limit (HH)	RY0010	0x161	Digital zero
	RX0011			High limit (HI)	RY0011		Clear digital zero
	RX0012			OK (OK)	RY0012		Zero balance displacement
	RX0013			Low limit (LO)	RY0013		Enable/disable judgment output
	RX0014			Low low limit (LL)	RY0014		Start/stop measurement
	RX0015		Displacement judgment results	High limit (HI)	RY0015		
	RX0016			OK (OK)	RY0016		Clear results (reset measurement results)
	RX0017			Low limit (LO)	RY0017		Force backlight lighting
	RX0018		Band judgment results	High limit (HI)	RY0018		Prevent touchscreen operation
	RX0019			OK (OK)	RY0019		Switch zone
	RX001A			Low limit (LO)	RY001A		
	RX001B		Measuring		RY001B		Clear peak/bottom
	RX001C		Measurement complete		RY001C		
	RX001D		SD error		RY001D		
	RX001E		Unit error		RY001E		
	RX001F		Load cell error		RY001F		

Station	TD-9000T (CCL) ➡ Master station			Master station ➡ TD-9000T (CCL)		
	Remote input	Address	Name	Remote output	Address	Name
2	RX0020	0x0E2	CONTINUE	RY0020	0x162	
	RX0021		STOP	RY0021		
	RX0022		WAIT	RY0022		
	RX0023		REC	RY0023		
	RX0024		Screen display (indicator value)	RY0024		Screen selection (indicator value)
	RX0025		Screen display (graph)	RY0025		Screen selection (graph)
	RX0026		Screen display (static strain)	RY0026		Screen selection (static strain)
	RX0027			RY0027		
	RX0028		Sensor number (response) (2-bit: 0–3)	RY0028		Sensor number (designation) (2-bit: 0–3)
	RX0029			RY0029		
	RX002A		Work number (response) (4-bit: 0–15)	RY002A		Work number (designation)* (4-bit: 0–15)
	RX002B			RY002B		
	RX002C			RY002C		
	RX002D			RY002D		
	RX002E			RY002E		
	RX002F			RY002F		
	RX0030 – RX003F	0x0E3		RY0030 – RY003F	0x163	

*This can only be used when WORK SWITCHING is "EXT. INPUT" (External input), MEMORY CONTROL is "ALLOW", and measurement status is "CONTINUE".

Station	TD-9000T (CCL) ➡ Master station				Master station ➡ TD-9000T (CCL)		
	Remote input	Address	Name		Remote output	Address	Name
3	RX0040	0x0E4	Zone 1 load	Low limit (LO)	RY0040	0x164	
	RX0041			OK (OK)	RY0041		
	RX0042			High limit (HI)	RY0042		
	RX0043		Zone 2 load	Low limit (LO)	RY0043		
	RX0044			OK (OK)	RY0044		
	RX0045			High limit (HI)	RY0045		
	RX0046		Zone 3 load	Low limit (LO)	RY0046		
	RX0047			OK (OK)	RY0047		
	RX0048			High limit (HI)	RY0048		
	RX0049		Zone 4 load	Low limit (LO)	RY0049		
	RX004A			OK (OK)	RY004A		
	RX004B			High limit (HI)	RY004B		
	RX004C		Zone 5 load	Low limit (LO)	RY004C		
	RX004D			OK (OK)	RY004D		
	RX004E			High limit (HI)	RY004E		
	RX004F				RY004F		
	RX0050	0x0E5	Zone 1 displacement	Low limit (LO)	RY0050	0x165	
	RX0051			OK (OK)	RY0051		
	RX0052			High limit (HI)	RY0052		
	RX0053		Zone 2 displacement	Low limit (LO)	RY0053		
	RX0054			OK (OK)	RY0054		
	RX0055			High limit (HI)	RY0055		
	RX0056		Zone 3 displacement	Low limit (LO)	RY0056		
	RX0057			OK (OK)	RY0057		
	RX0058			High limit (HI)	RY0058		
	RX0059		Zone 4 displacement	Low limit (LO)	RY0059		
	RX005A			OK (OK)	RY005A		
	RX005B			High limit (HI)	RY005B		
	RX005C		Zone 5 displacement	Low limit (LO)	RY005C		
	RX005D			OK (OK)	RY005D		
	RX005E			High limit (HI)	RY005E		
	RX005F				RY005F		
4	RX0060 – RX006F	0x0E6			RY0060 – RY006F	0x166	
	RX0070 – RX0078	0x0E7			RY0070 – RY0078	0x167	
	RX0079				RY0079		
	RX007A		Error status flag		RY007A		
	RX007B		Remote READY		RY007B		
	RX007C				RY007C		
	RX007D				RY007D		
	RX007E				RY007E		
	RX007F				RY007F		

3-3-3. Remote registers with 2 stations occupied (pages 0–3)

Real-time page (page 0)

Station	TD-9000T (CCL) ➡ Master station				Master station ➡ TD-9000T (CCL)			
	Remote input	Address	Name		Remote output	Address	Name	Area
1	RWr0000	0x2E0	Real-time value	Load value	RWw0000	0x1E0	High high limit (HH)	Exclusive
	RWr0001	0x2E1		Displacement value	RWw0001	0x1E1	High limit (HI)	
	RWr0002	0x2E2	Peak load value		RWw0002	0x1E2	Low limit (LO)	
	RWr0003	0x2E3	Bottom load value		RWw0003	0x1E3	Low low limit (LL)	
2	RWr0004	0x2E4	Command data		RWw0004	0x1E4	Command data	Common
	RWr0005	0x2E5			RWw0005	0x1E5		
	RWr0006	0x2E6	Command No.		RWw0006	0x1E6	Command No.	
	RWr0007	0x2E7	Error code		RWw0007	0x1E7		

Results page (page 1)

Station	TD-9000T (CCL) ➡ Master station				Master station ➡ TD-9000T (CCL)			
	Remote input	Address	Name		Remote output	Address	Name	Area
1	RWr0000	0x2E0	Band	Load value	RWw0000	0x1E0		Exclusive
	RWr0001	0x2E1		Displacement value	RWw0001	0x1E1		
	RWr0002	0x2E2	Zone 1	Load value	RWw0002	0x1E2		
	RWr0003	0x2E3		Displacement value	RWw0003	0x1E3		
2	RWr0004	0x2E4	Command data		RWw0004	0x1E4	Command data	Common
	RWr0005	0x2E5			RWw0005	0x1E5		
	RWr0006	0x2E6	Command No.		RWw0006	0x1E6	Command No.	
	RWr0007	0x2E7	Error code		RWw0007	0x1E7		

Results pages (pages 2–3)

Station	TD-9000T (CCL) ➡ Master station				Master station ➡ TD-9000T (CCL)			
	Remote input	Address	Name		Remote output	Address	Name	Area
1	RWr0000	0x2E0	Zone 2N-2	Load value	RWw0000	0x1E0		Exclusive
	RWr0001	0x2E1		Displacement value	RWw0001	0x1E1		
	RWr0002	0x2E2	Zone 2N-1	Load value	RWw0002	0x1E2		
	RWr0003	0x2E3		Displacement value	RWw0003	0x1E3		
2	RWr0004	0x2E4	Command data		RWw0004	0x1E4	Command data	Common
	RWr0005	0x2E5			RWw0005	0x1E5		
	RWr0006	0x2E6	Command No.		RWw0006	0x1E6	Command No.	
	RWr0007	0x2E7	Error code		RWw0007	0x1E7		

3-3-4. Remote I/O with 2 stations occupied

Station	TD-9000T (CCL) ➡ Master station				Master station ➡ TD-9000T (CCL)		
	Remote input	Address	Name		Remote output	Address	Name
1	RX0000	0x0E0	Exclusive area response		RY0000	0x160	Exclusive area request
	RX0001				RY0001		
	RX0002		Common area response		RY0002		Common area request
	RX0003		R/W (response)		RY0003		R/W (request)
	RX0004		RWr page selection (response) (page: 0–4)		RY0004		RWr page selection (page: 0–4)
	RX0005				RY0005		
	RX0006		CPU operating properly		RY0006		
	RX0007		Decimal point position 1 (load)		RY0007		
	RX0008		Decimal point position 2 (load)		RY0008		
	RX0009		Decimal point position 3 (load)		RY0009		
	RX000A		Decimal point position 1 (displacement)		RY000A		
	RX000B		Decimal point position 2 (displacement)		RY000B		
	RX000C		Decimal point position 3 (displacement)		RY000C		
	RX000D				RY000D		
	RX000E		Trigger output 1		RY000E		
	RX000F		Trigger output 2		RY000F		
	RX0010	0x0E1	Overall load judgment	High high limit (HH)	RY0010	0x161	Digital zero
	RX0011			High limit (HI)	RY0011		Clear digital zero
	RX0012			OK (OK)	RY0012		Zero balance displacement
	RX0013			Low limit (LO)	RY0013		Enable/disable judgment output
	RX0014			Low low limit (LL)	RY0014		Start/stop measurement
	RX0015		Overall displacement judgment	High limit (HI)	RY0015		
	RX0016			OK (OK)	RY0016		Clear results (reset measurement results)
	RX0017			Low limit (LO)	RY0017		Force backlight lighting
	RX0018		Band judgment	High limit (HI)	RY0018		Prevent touchscreen operation
	RX0019			OK (OK)	RY0019		Switch zone
	RX001A			Low limit (LO)	RY001A		
	RX001B		Measuring		RY001B		Clear peak/bottom
	RX001C		Measurement complete		RY001C		
	RX001D		SD error		RY001D		
	RX001E		Unit error		RY001E		
	RX001F		Load cell error		RY001F		

Station	TD-9000T (CCL) ➡ Master station			Master station ➡ TD-9000T (CCL)		
	Remote input	Address	Name	Remote output	Address	Name
2	RX0020	0x0E2	CONTINUE	RY0020	0x162	
	RX0021		STOP	RY0021		
	RX0022		WAIT	RY0022		
	RX0023		REC	RY0023		
	RX0024		Screen display (indicator value)	RY0024		Screen selection (indicator value)
	RX0025		Screen display (graph)	RY0025		Screen selection (graph)
	RX0026		Screen display (static strain)	RY0026		Screen selection (static strain)
	RX0027			RY0027		
	RX0028		Sensor number (response) (2-bit: 0–3)	RY0028		Sensor number (designation) (2-bit: 0–3)
	RX0029			RY0029		
	RX002A		Work number (response) (4-bit: 0–15)	RY002A		Work number (designation)* (4-bit: 0–15)
	RX002B			RY002B		
	RX002C			RY002C		
	RX002D			RY002D		
	RX002E			RY002E		
	RX002F			RY002F		
	RX0030 to RX0038	0x0E3		RY0030 to RY0038	0x163	
	RX0039			RY0039		
	RX003A		Error status flag	RY003A		
	RX003B		Remote READY	RY003B		
	RX003C			RY003C		
	RX003D			RY003D		
	RX003E			RY003E		
	RX003F			RY003F		

*This can only be used when WORK SWITCHING is "EXT. INPUT" (External input), MEMORY CONTROL is "ALLOW", and measurement status is "CONTINUE".

Clear peak/bottom

Clear peak and bottom load values.

Prevent touchscreen operation

Disable touchscreen operation while this is ON.

Enable/disable judgment output

Disable all judgment output while this is ON.

Force backlight lighting

Enable the backlight while this is ON.

Switch zone

This is enabled when ZONE SWITCHING is set to EXT. INPUT. While ON, it becomes zone. Switching is limited to zones that have zone judgment enabled.

Clear results (reset measurement results)

Judgment results are cleared at the moment this becomes ON.

All judgment output is turned OFF, and continuous judgment (CONTINUE) starts.

Start/stop measurement

When "MEASURE. START. COND." or "MEASURE. STOP.COND." is set to "EXT. SIGNAL"on the WORK settings screen, this controls starting and stopping measurement.

Select the control method with EXT. START/STOP.

When set to "EDGE", measurement will start or stop when it switches from OFF to ON.

When set to "LEVEL", measurement will start when it switches to ON and stop when it switches to OFF.

Digital zero

Digital zero is executed at the moment this becomes ON.

Zero balance displacement

The displacement sensor is zero-balanced at the moment this becomes ON.

Sensor number (designation)

Switch the sensor memory to the specified number.

ATTENTION

To enable sensor switching, set MEMORY CONTROL to "ALLOW" (page 25).

Work number (designation)

Use to switch to the specified work number.
WORK SWITCHING 1 is the LSB and WORK SWITCHING 8 is the MSB.

ATTENTION

Make the following settings to enable work switching.

- CONTROL INPUT on the FIELD NETWORK settings screen: COMM.
- MEMORY CONTROL on the FIELD NETWORK settings screen: ALLOW
- WORK SWITCHING on the WORK settings screen: EXT. INPUT

Error status flag

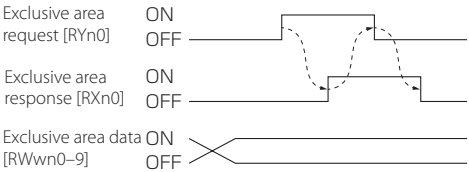
Status	Error code		Content
	High byte	Low byte	
Normal	0	0	No error
Equipment error	1	0	A system error has occurred
Calibration error	2	0	A calibration error has occurred.
		1	The calibration value is locked.
		2	Internal calibration error
Measurement error	3	0	–FULL (less than minimum display value)
		1	+FULL (greater than maximum display value)
		2	–OVER FULL (exceeding maximum negative input)
		3	+OVER FULL (exceeding maximum input)
		4	DA output exceeds output range in negative direction.
		5	DA output exceeds output range in positive direction.
Command error	4	0	Command execution error
		1	The setting value is locked.
		2	Command No. error

3-4. Setting procedures

3-4-1. Writing exclusive area values to the unit

Confirm that all exclusive and common area requests and responses are off before conducting the following.

When the master station "Exclusive area request" (RYn0) is turned on, the exclusive area data will be written to this unit.
When this unit completes writing exclusive area data, "Exclusive area response" (RXn0) will become on.
After confirming that the "Exclusive area response" (RXn0) from this unit is on, turn the "Exclusive area request" (RYn0) off for the master station.



3-4-2. Reading, writing and operations using commands in the common area

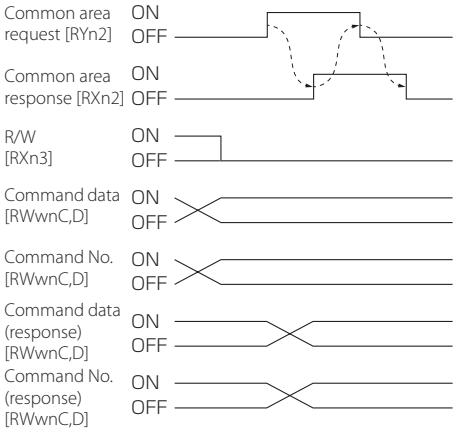
Confirm that all exclusive and common area requests and responses are off before conducting the following.

When the master station "Common area request" (RYn2) is turned on, this unit will execute a command according to the R/W request (RYn3) and Command number (RWwnE).
The command will use RWwnC-D command data to read or write the unit's data or execute the specified operation.
When this unit completes executing the command, "Common area response" (RXn2) will become on.
After confirming that the "Common area response" (RXn2) from this unit is on, turn the "Common area request" (RYn2) off for the master station.

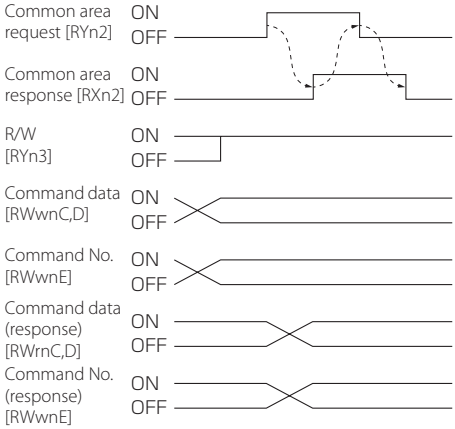
NOTE

If a command ends with an error, the RWrnE Command No. response will be 0xFFFF.

Writing operation R/W = OFF



Reading operation R/W = ON



ATTENTION

- The values that handle command data are all two's complement. Input values for the valid number of digits, excluding the decimal point.
- After a command is executed, check the command number response or the error code to confirm whether or not the command has been executed properly.
- Commands will not be executed properly when a settings menu screen is open.

3-4-3. Transmission of measurement and band waveforms

Use page 2 of the remote register to do this (page 9). These are enabled only when set to 4 STATIONS.
In the following explanation, station number 1 is used as an example.

Band waveform start and stop positions

When making settings, set values for the band start position (RWw000) and the band end position (RWw0001), and set control (waveform selection) (RWw000B) to 0x10.
Then, by turning R/W (RY0003) off and Exclusive area request (RY0000) on, the settings will be written to the unit.

To read settings into the exclusive area, after setting control (waveform selection) (RWw000B) to 0x10, without changing anything else, turn on both R/W (RY0003) and Exclusive area request (RY0000). Then, the band start position (RWr0000) and the band end position (RWr0001) will be read.

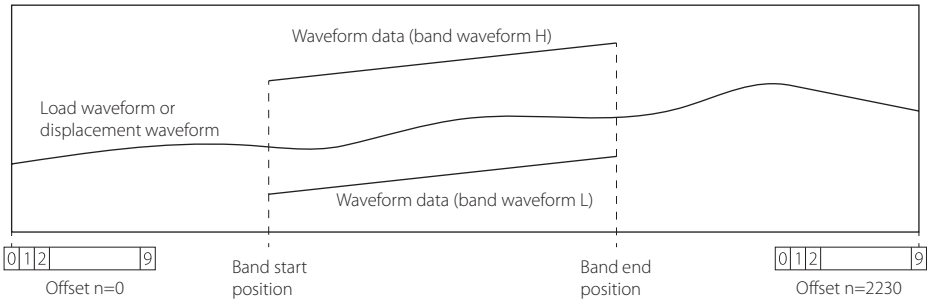
Waveform data

The maximum amount of data is 2240 for waveforms.
All waveform data is divided into 224 parts, and 10 data points are read and written with 1 exclusive area request.

NOTE

- Excluding decimal points, send indicator values as 2-byte binary data for each single data unit.
- Look up the decimal point position with load decimal point position (1002) and displacement decimal point position (1505).

Waveform data example



Writing band waveforms

Since 10 points of waveform data are written to the exclusive area at a time, the offset (RWw000A) must be changed and writing conducted multiple times. Band waveform data is written to the range between the band waveform start position and stop position.
To write band waveform data to the exclusive area, set Offset (RWw000A) to the band data offset (0–2239), and set the waveform data from band waveform data (n) (RWw0000) to (n+9) (RWw0009). Then, set the waveform bit written to Control (waveform selection) (RWw000B) to a value of 1.
After writing band waveform data, by turning R/W (RY0003) off and turning Exclusive area request (RY0000) on, the band waveform data of the exclusive area will be written to the unit.

Reading waveforms

Use the same procedures to read band waveform (H), band waveform (L), displacement waveform and waveform data.
Set Offset (RWw000A) to the offset of the waveform data being read and Control (waveform selection) (RWw000B) to a value of 1.
Then, by turning both R/W (RY0003) and Exclusive area request (RY0000) on, the waveform will be read into the exclusive area.
The waveform data from n (RWr0000) to n+9 (RWr0009) will be read and the data acquired.

3-5. Commands

- See "Reading, writing and operations using commands in the common area" on page 17 for details about reading and writing by command.

NOTE

If values other than parameters are set, they will be ignored.

System

Content	Command	Command No.	Byte	Parameter	Note
System	Backlight setting (LCD BRIGHTNESS)	5301	1	0 to 3	
	Backlight time	5302	1	0 to 255	
	Language	5303	1	0: Japanese, 1: English, 2: Chinese, 3: Korean	
	Home screen	5304	1	0: Value display, 1: Waveform display	
	OK counter	5410	4	100: Reset	64 in hexadecimal display
	NG counter	5411	4	100: Reset	64 in hexadecimal display
	Device number	5500	4		
	Beep	5501	1	0: OFF, 1: KEY, 2: KEY + JUDGE	
	External measurement signal mode (EXT. START/STOP)	5502	1	0: Edge, 1: Level	
Date & time setting	Format	5503	1	0: YYYY-MM-DD, 1: DD-MM-YYYY, 2: MM-DD-YYYY	
	Date (year, month and day)	5507	4	YYMMDD	BCD (highest 8-bit is 0)
	Time	5508	4	HHMMSS	BCD (highest 8-bit is 0)
Lock	Lock calibration values (CALIBRATION LOCK)	5201	1	0: Unlock, 1: Lock	
	Lock work (WORK LOCK)	5202	1	0: Unlock, 1: Lock	
	Lock all (ALL LOCK)	5203	1	0: Unlock, 1: Lock	
	Lock touchscreen	5204	1	0: Unlock, 1: Lock	
Internal memory	Save results (SAVING)	5400	1	0: NO, 1: AUTO SAVE, 2: SAVE ON ERROR	
	Overwrite (OVERWRITING)	5401	1	0: Forbid, 1: Allow	
	Delete all	5402	4	100: Execute	

Content	Command	Command No.	Byte	Parameter	Note
Trigger output 1	Output item	5510	1	0: None, 1: Load, 2: Displacement, 3: OK count, 4: NG count	
	Load output threshold (HI)	5511	4	±99999	
	Load output threshold (LO)	5512	4	±99999	
	Displacement output threshold (HI)	5513	4	±99999	
	Displacement output threshold (LO)	5514	4	±99999	
	OK count threshold	5515	4	0 to 99999	
	NG count threshold	5516	4	0 to 99999	
Trigger output 2	Output item	5520	1	0: None, 1: Load, 2: Displacement, 3: OK count, 4: NG count	
	Load output threshold (HI)	5521	4	±99999	
	Load output threshold (LO)	5522	4	±99999	
	Displacement output threshold (HI)	5523	4	±99999	
	Displacement output threshold (LO)	5524	4	±99999	
	OK count threshold	5525	4	0 to 99999	
	NG count threshold	5526	4	0 to 99999	
SD card	Automatic saving (AUTO SAVE)	5600	1	0: NO, 1: AUTO SAVE, 2: SAVE ON ERROR	
	Format	5601	1	1: Execute	
	Export settings	5602	1	1: Execute	
	Import settings	5603	1	1: Execute	
Serial communication (SERIAL COMM.)	Port selection	5700	1	0: Front USB (USB), 1: Back D-sub (D-SUB)	
	Communication mode	5702	1	0: TD format, 1: TD format (BCC), 2: Continuous TX, 3: Send results	
	Baud rate	5703	1	0: Reserved, 1: 9600, 2: 19200, 3: 38400, 4: 57600, 5: 115200	
	Bit length	5704	1	0: 8-bit, 1: 7-bit	
	Parity bit	5705	1	0: No, 1: Odd, 2: Even	
	Stop bit	5706	1	0: 1-bit, 1: 2-bit	
	Delimiter	5707	1	0: CR+LF, 1: CR	

Field network

Content	Command No.	Byte	Parameter	Note
Control signal input	5710	1	0: Control terminal (CONT. TERMINAL), 1: Communication control (COMM.)	
Memory control	5711	1	0: Forbid, 1: Allow	

Calibration

Content	Command	Command No.	Byte	Parameter	Note
Sensor	Sensor memory	1000	1	0: Sensor memory 1, 1: Sensor memory 2, 2: Sensor memory 3, 3: Sensor memory 4	
	Sampling	1006	1	0: 5 kHz, 1: 25 kHz	
	Y axis	1007	1	0: Load, 1: Load and displacement	
	X axis	1008	1	0: Time, 1: Displacement	
	X axis full scale	1009	1	0: 80 ms, 1: 170 ms, 2: 400 ms, 3: 800 ms, 4: 2.0 s, 5: 4.0 s, 6: 10.0s, 7: 30.0 s, 8: 60.0 s, 9: 90.0 s	The definitions change according to the X axis setting (time/ displacement).
	Unit shown setting	1401	1	0: None, 1: N, 2: kN, 3: kPa, 4: MPa, 5: g, 6: kg, 7: ton, 8: mNm, 9: Nm, 10: kNm, 11: dN, 12: Pa, 13: mBar, 14: Bar, 15: m/s^2, 16: Gal, 17: mm	
	Maximum display value (MAX. DISP. VALUE)	1404	4	1 to 99999	
	Sensor input logic	1405	1	0: Standard, 1: Reversed	
	Low-pass filter	2001	1	0: OFF, 1: 3 Hz, 2: 10 Hz, 3: 30 Hz, 4: 100 Hz, 5: 300 Hz, 6: 1000 Hz	
	Moving average number (MOVING AVG. NUM.)	2002	2	0: Disabled, 2 to 2048: Moving average number	
	Automatic digital filter (AUTO DIGITAL FILTER)	2003	1	0: OFF, 1: ON	
	Digital zero limit (D/Z LIMIT SETTING)	2302	4	00000 to 99999	
	Digital offset	2303	4	±19999	
Load cell	Bridge voltage	1001	1	0: 2.5 V, 1: 5 V, 2: 10 V	
	Load decimal point position	1002	1	0: None, 1: 0.0, 2: 0.00 3: 0.000, 4: 0.0000	
	Zero point input calibration	1003	4	−3100 to +3100 (−3.100 to 3.100 mV/V)	
	Zero balancing	1004	1	1: Execute	
	Remote sense	1005	1	0: Unused, 1: Used	
	Reset zero balancing	1100	1	1: Execute	
	Rated output value (RATED OUTPUT)	1101	4	100 to 3200, (0.100 to 3.200 mV/V)	
	Rated capacity value (equivalent input)	1102	4	1 to 99999	
	Rated capacity value (actual load)	1103	4	1 to 99999	
	TEDS calibration (TEDS CALIB.)	1104	1	1: Execute	

Content	Command	Command No.	Byte	Parameter	Note
Linearization	Enable/disable linearization	1200	1	0: Disabled, 1: Enabled	
	Select linearization point	1201	1	1 to 5	The point designated by this can be changed with the following commands.
	Selection point enabled/ disabled	1202	1	0: Disabled, 1: Enabled	
	Sensor output value for calibration point	1203	4	4-digit sensor output value (no decimal) (0 < setting value < rated output value)	Setting this value will calculate the load value from the current calibration value and make it the default output load value for the calibration point.
	Output load value for calibration point (equivalent input)	1204	4	±99999	An error will result if the difference with the default value is 5% or more.
	Output load value for calibration point (actual load input)	1205	4	±99999	
D/A	D/A output setting	1301	1	0: Voltage, 1: Current	
	D/A max. voltage	1302	1	1 to 10	
	D/A zero	1303	4	±99999	
	D/A full scale	1304	4	±99999	
TEDS sensor	Serial number	6001	4		BCD
	Maximum rated capacity	6002	4		BCD (highest byte is decimal point position)
	Maximum rated output	6003	4		BCD (highest byte is decimal point position)
	Sensor impedance	6004	4		BCD (highest byte is decimal point position)
	Max. excitation level	6005	4		BCD (highest byte is decimal point position)
	Calibration date (CAL. DATE)	6006	4		BCD
	Model number	6007	2		BCD
Displacement sensor	Reset zero balancing (voltage)	1500	1	1: Execute	
	Unit shown	1501	1	1: µm, 2: mm, 3: cm, 4: m, 5: rad, 6: deg, 0: None	
	Input mode	1502	1	0: Pulse, 1: Voltage	
	Sensor input logic	1503	1	0: Standard, 1: Reversed	
	Zero balancing	1504	1	1: Execute	
	Displacement decimal point position	1505	1	0: None, 1: 0.0, 2: 0.00 3: 0.000, 4: 0.0000	

Content	Command	Command No.	Byte	Parameter	Note
Pulse displacement sensor	Count number (higher 2 digits)	1600	4	Higher 2 digits (0–15)	Always set from higher.
	Count number (lower 6 digits)	1601	4	Lower 6 digits (000000–999999)	1–15000000 range with higher
	Display value (equivalent input)	1602	4	00001–99999	
	Display value (actual load)	1603	4	00001–99999	
	Zero position	1604	4	±99999	
	Moving average number (MOVING AVG. NUM.)	1605	2	0: Disabled, 2 to 2048: Moving average number	
	Output phase (AB, A)	1606	1	0: AB phase, 1: A phase	
Voltage displacement sensor	Rated output	1610	4	0.100–5.200 V	
	Display value (equivalent input)	1612	4	00001–99999	
	Display value (actual load)	1613	4	00001–99999	
	Zero position	1614	4	±99999	
	Moving average number (MOVING AVG. NUM.)	1615	2	0: Disabled, 2 to 2048: Moving average number	
	Low-pass filter	1616	1	0: 10 Hz, 1: 30 Hz, 2: 100 Hz, 3: 300 Hz	

Work

Content	Command	Command No.	Byte	Parameter	Note
Work	Work number	7000	1	1 to 16 (enabled only during manual selection)	
	Switch work (WORK SWITCHING)	7001	1	0: Manually, 1: External input (EXT. INPUT)	
	Copy work	7002	1	0: All, 1–16: Work number	
Measurement trigger	Measurement starting condition	7003	1	0: External signal (EXT. SIGNAL) 1: External & load (EXT. & LOAD) 2: External & displacement (EXT. & DISP) 3: Load ↑ 4: Load ↓ 5: Displacement ↑ 6: Displacement ↓	
	Measurement starting level	7004	4	±99999	
	Measurement stopping condition	7005	1	0: External signal (EXT. SIGNAL), 1: External or load (EXT. | LOAD), 2: External or displacement (EXT. | DISP), 3: External or Time (EXT. | TIME)	
	Measurement stopping level	7006	4	±99999	
Continuous judgment	Enable HHLL	7010	1	0: Disabled, 1: Enabled	
	HH	7011	4	±99999	
	HI	7012	4	±99999	
	LO	7013	4	±99999	
	LL	7014	4	±99999	

Content	Command	Command No.	Byte	Parameter	Note
Band judgment	Enable/Disable waveform comparison (WAVEFORM COMP.)	7100	1	0: Disabled, 1: Enabled	If no reference waveform has been set, it will not become enabled.
Zone judgment	Zone switching	7101	1	0: Preset, 1: External input	
	Indicator value display (INDICATOR VALUE)	7102	1	0: Input value, 1 to 5: Zone number	
Zone settings	Set zone number	7200	1	1–5 (resets to 1 when power turned on/off)	The zone set by this can be changed with the following commands.
	Enable zone	7201	1	0: Disabled, 1: Enabled	
	Zone range starting point	7202	4	0 to 99999	
	Zone range ending point	7203	4	0 to 99999	
	Load high limit (HI)	7204	4	±99999	
	Load low limit (LO)	7205	4	±99999	
	Displacement high limit (HI)	7206	4	0 to 99999	This can be set when the X axis is set to displacement.
	Displacement low limit (LO)	7207	4	0 to 99999	This can be set when the X axis is set to displacement.
	Judgment method	7208	1	0: Constant comparison, 1: Sample, 2: Peak, 3: Bottom, 4: Peak-to-peak, 5: Average value, 6: Maximum, 7: Minimum, 8: Inflection point	
Maximum/ minimum	Load difference (LOAD DIF.)	7211	4	±99999	
	Scaling factor	7212	1	00 to 99 (input without decimal point) (0.0 to 9.9)	Values higher than 9.9 automatically rounded to 9.9.
	Number of detections (COUNT)	7213	1	1 to 10	Values higher than 10 automatically rounded to 10.
Inflection point (INFLECTION)	Detection starting load (STARTING LOAD)	7220	4	±99999	
	Detection extent A (WIDTH A)	7221	4	1 to 9999	
	Detection extent B (WIDTH B)	7222	4	1 to 9999	
	Load difference (LOAD DIF.)	7223	4	±99999	
	Offset extent (OFFSET)	7224	4	0 to 99	

4-1. Setting value list

Item	Setting	Format	Default value	Setting range/options
Field network	CONTROL INPUT	Selection	CONT. TERMINAL	CONT. TERMINAL, COMM.
	MEMORY CONTROL	Selection	FORBID	FORBID, ALLOW
CC-Link	OPPUPIED STATIONS	Selection	4 STATIONS	4 STATIONS, 2 STATIONS
	STATION NUMBER	Input	1	1 to 63
	TRANSMISSION SPEED	Selection	10 Mbps	156 kbps, 625 kbps, 2.5 Mbps, 5 Mbps, 10 Mbps

ATTENTION

Conducting an operation with the screen, including starting/stopping measurement and switching sensors or work memories, at the same time that an operation is executed by communication could cause unpredictable malfunction. For this reason, we recommend prohibiting making changes on screen during communication.

4-2. SERIAL COMM.

Read the unit operation manual for details about serial communication protocol.

4-2-1. FIELD NETWORK

Content	Command No.	Default value	Setting item	Note
Control signal input (CONTROL INPUT)	5710	0: Control terminal (CONT. TERMINAL)	0: Control terminal (CONT. TERMINAL), 1: Communication control (COMM.)	
Memory control	5711	0: Forbid	0: Forbid, 1: Allow	

4-2-2. CC-Link

Content	Command No.	Default value	Setting item	Note
Number of stations occupied	5101	0: 4 stations occupied (4 STATIONS)	0: 4 stations occupied (4 STATIONS), 1: 2 stations occupied (2 STATIONS)	
Station number	5102	1	1 to 63	
Transmission speed	5103	4: 10 Mbps	0: 156 kbps, 1: 625 kbps, 2: 2.5 Mbps, 3: 5 Mbps, 4: 10 Mbps	

ATTENTION

Restart the unit after CC-Link settings are changed.

NOTE

"Field network" and "CC-Link" setting commands will be disabled if the corresponding options are not installed.

5. Specifications

General

Weight About 1,040 g

- Specifications and appearance are subject to change without notice.
- Weight and dimensions are approximate.
- Illustrations in this manual might differ slightly from production models.

TEAC

TEAC CORPORATION	1-47 Ochiai, Tama-shi, Tokyo 206-8530, Japan	Phone: +81-42-356-9154
TEAC AMERICA, INC.	10410 Pioneer Blvd. Unit #1, Santa Fe Springs, California 90670, U.S.A.	Phone: +1-323-726-0303
TEAC EUROPE GmbH. (EU Importer)	Bahnstrasse 12, 65205 Wiesbaden-Erbenheim, Germany	Phone: +49-(0)611-7158-349
TEAC UK Limited (UK Importer)	Luminous House, 300 South Row, Milton Keynes, Buckinghamshire, MK9 2FR, UK	Phone: +44-1923-797205
TEAC SALES & TRADING (ShenZhen) CO., LTD.	Room 817, Xinian Center A, Tairan Nine Road West, Shennan Road, Futian District, Shenzhen, Guangdong Province 518040, China	Phone: +86-755-88311561-2

0723 MA-3494C