# HG1T Small Teaching Pendant

# Operability combined with communication function

#### Well-suited for use as a teaching pendant for robots, various machines, and devices.

- Features 3-position enabling switch
- Optional design to meet specific needs of key sheet and mechanical switches
- Designed for easy one-hand operation. Lightweight 600g (not including cable)
- Software development for the HG1T is not necessary due to the standard system program
- Host communication with RS232C, RS485, and RS422
- Degree of protection IP54



\* HG1T with emergency stop switch (red button) is c-UL listed. HG1T with stop switch (gray button) is not c-UL listed.



#### **Type List**

LCD	Host I/F	Type No. (Ordering Type No.)	Remarks	Package Quantity
Transmissive LCD with backlight	RS232C/422	HG1T-SB12UH-A3	Cable length: 3m, Emergency stop switch (Button color: Red): 1 Illuminated pushbutton switch: 2, Selector switch (2-position): 1	1

#### • Accessories (Options)

Product Name	Type No. (Ordering Type No.)	Remarks	Package Quantity
Maintenance Cable	HG9Z-TCM22	Length: 2m	
Grip Belt	HG9Z-TS1	Used to hold pendant securely in hand	-
Wrist Strap*	HG9Z-PS1	Used to hold pendant securely on wrist	
Wall Mounting Bracket*	HG9Z-TK1	Aluminum, black	

\* Supplied with HG1T-SB12UH-A3

#### **General Specifications**

	Rated Power Voltage	ge 24V DC (ripple: 10% maximum)					
SL	Power Voltage Range	21.6 to 26.4V DC					
tio	Power Consumption	4W maximum					
ecifica	Allowable Momentary Power Interruption	10 ms maximum					
Sp	Inrush Current	15A maximum					
ctrical	Dielectric Strength	500V AC 10 mA, 1 minute (between power and FG terminals	s)				
Elec	Insulation Resistance	10 $M\Omega$ minimum (between power and FG terminals (500V DC megger)	s)				
	Operating Temperature	0 to 40°C (no freezing)					
	Operating Humidity	30 to 85% RH (no condensation)					
<i>"</i>	Storage Temperature	-20 to +60°C (no freezing)					
ions	Storage Humidity	30 to 85% RH (no condensation)	tion)				
al Specificati	Vibration Resistance (Damage Limit)	10 to 55Hz: 9.8 m/s <sup>2</sup> (2 hours each on three mutu- ally perpendicular axes)					
	Shock Resistance (Damage Limit)	98 m/s <sup>2</sup> (5 shocks each on three mutually perpen- dicular axes)					
vironmente	Noise Immunity	Fast transient/burst test, Common mode: Level 3 Power terminals: ±2 kV Communication line: ±1 kV	IEC61000-4-4				
Ë	Electrostatic Discharge	ESD-3 (RH-1) Level 3 (Contact ±6 kV, aerial ±8 kV)	IEC61000-4-2				
	Atmosphere	No corrosive gas					
	Ground	Functional ground (connect to the ground to ensure correct operation)					
ion	Degree of Protection	IP54 (not including the cable connector)					
'uct	Cable Length	RS232C: 3 to 10m, RS422/485: 3 to 20m					
cifi	Dimensions	$133W \times 255H \times 58.3D$ mm					
Spe	Weight (approx.)	600g maximum (not including cat	ole)				
	Mounting	Hand-held (or can be hung on the mounting bracket)	wall using the				

# Programming

Standard programming is designed to reduce the burden of software development by a customer. It performs screen display control and transmits information to the host device, when pressing keys in response to the commands from the host.

#### Command List

Command Character	Description
С	Clear screen
V	LCD ON/OFF
M	Set character display mode
Р	Set cursor position
A	Set character display area
I	Set cursor shape
E	Set automatic scrolling
S	Display character
L	Draw line
Q	Draw rectangle
R	Invert selected area
0	Draw circle/eclipse
D	Draw dot
н	Draw character
e	Delete all saved drawings
b	Save a drawing
r	Save a drawing on display
w	Draw saved screen
с	Draw saved drawing
d	Graphic drawing
v	Read drawing storage status
g	Read saved drawing
N	Enable numerical input mode
Z	Disable numerical input mode
К	Read key pressing condition
Т	Read touch panel pressing condition
J	LED ON/OFF
В	Buzzer ON/OFF
F	Set operation
G	Read operation setting
X	Read version
U	No action

# **Display Specifications**

Display Device	Transmissive STN Monochrome LCD (with backlight)
Effective Display Area	95.96W × 31.96H mm
Display Resolution	$192W \times 64H$ pixels
Display Color	Transmissive LCD with backlight:
(Background and backlight)	Dark blue (Yellow green)

# **Operation Specifications**

#### Membrane Switch Specifications

Method	Tactile switch
No. of Switches	9 × 5 columns
Operating Force	3N maximum
Life	500,000 operations minimum
Indicator	LED1 to 15: Amber

#### Mechanical Switch Specifications (Example: HG1T-SB12UH-A3)

Item	Emergency Stop Switch *1	Enabling Switch *1	
Code	A	E	
Type No.	HA1E-V2S2VR (IDEC)	HE3B-M2 (IDEC)	
Quantity	1	1	
Contact Rating	24V DC, 1A *2	24V DC, 50 mA	
Contact Configuration	2NC	3-position contact × 2 (OFF-ON-OFF)	
Item	Illuminated Pushbutton (Momentary) *3	Illuminated Pushbutton (Momentary) *3	
Code	B1	B2	
Type No.	LA1L-M1T14VR (IDEC)	LA1L-M1T14VG (IDEC)	
Quantity	1	1	
Contact Rating	24V DC, 50 mA	24V DC, 50 mA	
Contact Configuration	1NO	1NO	
LED Color	Red	Green	
Item	Selector Switch	w/o Switch	
Code	C1	C2	
Type No.	LA1S-2T2 (IDEC)	-	
Quantity	1	-	
Contact Rating	24V DC, 50 mA	-	
Contact Configuration	1NO-1NC	-	

\*1: EN60947-1 compliant

\*2: With a larger applied current, the voltage drop tends to be bigger due to resistance of the cable.

\*3: LED illumination can be controlled for up to 3 LEDs to turn on and off.

#### Dimensions



Inte • RS	erface S	Specifi	cations		Flush Silhouette
Elect	trical Charac	cteristics E	EIA RS232C compliant		Control
Tran	smission Sp	eed 3	38400, 19200, 9600, 48 300 bps	Units	
Sync	chronization	ŀ	Asynchronous		Display
Com	munication	Method F	Full duplex or half duple	X	Lights
• RS	485				Display
Elect	trical Charac	cteristics E	EIA RS485 compliant		Units
Transmission Speed			38400, 19200, 9600, 48 300 bps	00, 2400, 1200, 600,	O-fat.
Sync	chronization	A	Asynchronous		Products
Com	munication I	Method H	Half duplex		
• RS	422				Terminal Blocks
Elect	trical Charac	cteristics E	EIA RS422 compliant		
Tran	smission Sp	eed	38400, 19200, 9600, 48 300 bps	00, 2400, 1200, 600,	Comm. Terminals
Sync	chronization	A	Asynchronous		
Communication Method Full duplex					
Note 1	1: The HG1T RS232C/4	is only avai 85 interface	lable with RS232C/422 a, not available with RS4	interface or 422/485 interface.	AS-Interface
Note 2	RS232C, I 2: Precautio Select cor	RS422, and on for comn mmunicatior	RS485 cannot be used nunication conditions a specifications, such a	simultaneously. s transmission speed,	Relays & Timers
	When a su of the LCD	ibstantially h indicator ar	m, and communication high transmission rate is nd other response are sl tly. Specify a proper trai	selected, performance ower and the data can- smission rate suited to	Sockets
Cor	the applica	ation. r <b>Pin A</b> s	ssignment ar	nd Functions	Circuit Protectors
1 -			13		Power
		••••••	D-sub 25	-pin connector (plug) 250-02 made by DDK)	Supplies
14 –			25		PLCs & SmartRelav
	RS	RS	RS232C/422	RS232C/485	
Pin	2320/422 Na	me	Fun	ction	Operator Interfaces
NO.	50		Evenue evenue d		
	FG		Prame ground BS422	B\$485	Sensors
2	RD2–	TDB	Receive data-	Communication data B	
3	RD2+	TDA	RS422 Receive data+	RS485 Communication data A	Control
4	SD2-	NC	RS422 Send data-	Unused	Stations
5	SD2+	NC	RS422 Send data+	Unused	Evologion
6	SG		Communication signation	al ground	Protection
7	DR (CTS)		RS232C communication	tion control input	
8	ER (RTS) RS232C communication control output				
9	E_NO1		E enabling switch co	References	
10	E_C1		E enabling switch co		
11	A_NC11	A emergency stop switch contact 1 terminal 1 (NC)			
12	A_NC12		A emergency stop sw terminal 2 (NC)	vitch contact 1	
13	24V DC (-	)	Power supply 24V DO	C (-)	
14	RD1		RS232C Receive dat	a	
15	SD1		RS232C Send data		
16	B1 NO (N	ote)			

Power supply 24V DC (+) Note: B1, B2, and C1 (COM) are connected to the power supply 24V DC (–) pin inside of the HG1T.

terminal 1 (NC)

terminal 2 (NC)

17

18

19

20

21

22

23

24

25

IDEC

B2\_NO (Note) C1\_NO (Note)

C1\_NC (Note)

SG

E\_NO2

A\_NC21

A\_NC22

24V DC (+)

E\_C2

B2 illuminated pushbutton NO contact

C1 selector switch NO contact

C1 selector switch NC contact

Communication signal ground

E enabling switch contact 2 (NO)

E enabling switch contact 2 (COM)

A emergency stop switch contact 2

A emergency stop switch contact 2

### **Ordering Information**

IDEC tailors HG1T small teaching pendants to your specific requirements. Available options are shown on the specification sheet below. Please discuss your specifications with IDEC's sales representatives before ordering. Minimum ordering quantity is 100 per lot.

#### **HG1T Specifications Sheet**

HG1T Sheet 01

to

Please use this sheet for specifications of the HG1T small teaching pend						l	Date:	
Customer		Departr	ment					
Contact Person		TEL		(	)	_		
Address								
Type No. (Ordering Type No.)	1 HG1T –SB12 H –MK ***	*-S	Hos	st				
Applications		Lot Quantity				Annual Quantity		
	① Light communication and at U (DC000C/400) W (DC000C/405)							

st communication code: U (RS232C/422), W (RS232C/485)

(2) Cable length code: Specify an integer in meters

When using RS232C: 3 to 10 (3 to 10m), When using RS422 or RS485: 3 to 20 (3 to 20m) MK\*\*\*\* shows IDEC control number.

#### Specify the Mechanical Switches

Determine the arrangement of mechanical switches first. For switch A, select the switch model (button color) and check the box. For switches B1, B2, C1, and C2, fill in the following columns for Switch Code, Color Code, and Contact with reference to the table on the right.

Switch	Α			Mechanical Switch     Arrangement	[	ø1	6 A6 Series C	control Units	Switch
Switch	Sur	itab Madal (		Front		to	r Switches B1,	B2, C1, C2	Code
Positior	1 30	iten wouer (	Button Color)			Illuminated Push	button	Momentary	R11
Δ	DEm	nergency sto	op switch (red)	A   B1   B2		(LED, gold conta	ct, 24V DC)	Maintained	R12
~	□Sto	op switch (g	ray)			Pushbutton Switch		Momentary	R21(L) *1
witch B	1 B2	C1 C2	(1.6 Sorios			(gold contact)		Maintained	R22(L) *1
	п, <b>Б</b> 2,	01, 02	(LO Selles			Pilot Light (LED,	24V DC)		R31
Cunu)							2-position	Maintained	R41
-ront		1		• When specifying B1 only			2-position	Spring return from right	R42
Switch	Switch	Color	Contact	• When speenying D1 only		Selector		Maintained	R43
Position	Code	Code	(1NO, 2NO)	ALC: A		(Gold contact)	3-nosition	Spring return from right	R44
B1						(aola contact)	3-position	Spring return from left	R45
				No.				Spring return two way	R46
B2				<ul> <li>When not specifying B1/B2</li> </ul>	[		0 nonition	Maintained	R51_*2
							2-position	Spring return from right	R52_*2
An extend	ed buttor	n guard is	provided			Key Selector		Maintained	R53_*2
around B2				New		(Gold contact)	0	Spring return from right	R54_*2
Side				Side		(aola contact)	3-position	Spring return from left	R55_*2
Switch	Switch	Color	Contact					Spring return two way	R56_*2
Position	Code	Code	(1NO, 2NO)			Dummy Unit			R91
C1				C2 C1		1: When order the switch c	ing the "Illur ode.	ninated lens type" butto	on, add "L"
C2				Front	2	2: When order removable p	ing a key se	lector switch, add the for e to the switch code.	ollowing ke

#### Specify the Key Sheet



For the key sheet arrangement, refer to the figure on the left. Check the indicators and keys to use and write the quantities in the table below.

No. of LED Indicators	pcs	15 pcs maximum
No. of Mem- brane Keys	pcs	45 pcs maximum
No. of Sheet Colors	colors	

The LED indicator color is amber.

IDEC will make a key sheet as specified by a customer. The customer is requested to design the key sheet and provide the data [File format: \*.AI (Adobe IIlustrator)]. IDEC can also design a key sheet for customer at an extra charge.

2-pos. Main- tained	A Q_®	B	C C B	2-pos. Return from Right	B		
3-pos. Main- tained	A Q B	B Q B	C C B	D O O O O O O O O	E Q <b>O</b> B	G Q <b>Ø</b> B	H O B B
3-pos. Return from Right	B	D C C C C C C C	G Q <b>O</b> B	3-pos. Return from Left	C C B	D C C C C C C C C C C C C	H C B B
3-pos. Return	D D	: Key	removab	le positior	1.		

2-way • Key retained position.

 Color Code (except for selector and key selector switches) Illuminated Pushbutton and Pilot Light: A (amber), G (green), R (red), W (white), Y (yellow) Pushbutton:

B (black), G (green), R (red), S (blue), W (white), Y (yellow) \_\_\_\_\_

# **Safety Precautions**

All products are manufactured under IDEC's rigorous quality control system, but users must add a backup or failsafe provision in applications where heavy damage or personal injury may be caused in case the HG1H/HG1T should fail.

In this catalog, safety precautions are categorized in order of importance to Warning and Caution:

/! Warning	signifies a hazard that could result in personal injury or death in the case of improper handling.
/ Caution	signifies a hazard that could result in personal

injury or physical damage in the case of improper handling.

# 🖄 Warnings

- The unit uses an LCD as a display device. The liquid inside the LCD is harmful to the skin. If the LCD is broken and the liquid gets on your skin or clothes, wash the liquid off using soap, and consult a doctor immediately.
- Emergency stop circuits must be configured outside the HG1H/ HG1T by using its emergency stop switch.
- Connect the equipped emergency stop switch and enabling switches to the HG1H/HG1T so that they work in the stop category "0" or "1" in accordance with EN60204-1.
- The D-sub connector provided with the HG1H/HG1T cable is not a water or dust-proof type. If you need a water and/or dust-proof connector, apply a waterproofing treatment to the inlet of cable connector or replace it with a D-sub connector that is waterproof.
- When using the HG1H/HG1T, make sure to securely place your finger on the enabling switch.

# A Caution

- Use of the HG1H/HG1T at high temperature and humidity, with condensation, corrosive gas, excessive vibration, and/or shocks may cause electric shock, fire, and/or malfunction.
- Do not drop the unit when handling or during transportation. It may cause failure and/or breakage of the unit.
- Connect the unit to a power source with a suitable rating. Improper connection may cause a fire.
- For wiring, select a suitable wire for the applied current and voltage.
- Fully check for safety before starting or stopping. Improper operation may cause damage to the machine and/or accidents.
- Do not disassemble, modify, or alter the unit.
- Dispose of the HG1H/HG1T unit as industrial waste.

# Instructions

- Installation environment
- In consideration of the product performance and safety, avoid installing the unit in the following locations:
- Where there is a high level of dust, salt air, or iron particles
- Where oil or chemical splashes occur
- Where direct sunlight falls on the unit
- Where a corrosive gas or flammable gas exists
- Where the HG1H/HG1T unit is subjected to vibration or shock
- Where condensation occurs due to rapid temperature change
- Where high-voltage devices or arc-generating equipment (such as electromagnetic switches, no-fuse breakers, etc.) are located nearby.
- Operating environment

Take the following points into consideration when installing the HG1H/HG1T on a wall.

- Install the HG1H/HG1T so that it will not be exposed to heat generated by other equipment.
- If you plan not to operate the unit using your hands, mount it on a wall or a stand. For wall mounting, use the mounting bracket on the back of the HG1T. For the HG1H, use the optional wall mount bracket (Type No.: HG9Z-HK1).
- Do not apply direct force to the D-sub connector.
- Installation of ferrite cores

When using the HG1T in environments where it is subjected to a lot of noise, it is recommended that ferrite cores be attached (ZCAT2436-1330: TDK Corporation, or equivalent) to either or both ends of the cable.



- Circuit Protectors
- Power Supplies

PLCs & SmartRelay

Dperator nterfaces

Sensors

Control Stations

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Explosion Protection

References

Safety Precautions

• Read safety precautions and operating instructions described in the instruction or operation manual and be sure to use the product properly.

Safety Products Illing the Terminal Blocks

Comm. Terminals

Flush

Silhouette

Control

Display

Lights

Display

Units

Units

AS-Interface

Relays &

Timers

Sockets

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IDEC: HG1T-SB12UH-A3