



## ø22 SMART RFID READER KW2D SERIES



# **Smart RFID Reader**

Manage user authority for machines and equipment Control and track access to production sites

**IDEC CORPORATION** 

## **Ø22 KW2D** Series

Compact and smart design ideal for factory automation environments



IP65/67-rated to protect from washdowns and oil spills.

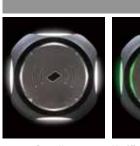


**Designed to** work on metal surfaces often used at factory automation sites.



Equipped with an LED easily visible from the side and an auxiliary buzzer, the RFID reader enables visible and audible feedback on operation status.

<sup>\*</sup> Can be controlled from a host device (such as a touch panel or PLC).



**Standby** 



**Verification - Success** 



**Verification - Error** 

### **Panel Mount RFID Reader**



## An Ethernet port enhances connection compatibility with host devices

- Supported protocol: Modbus TCP (server)
- \* EtherNet/IP and CC-LINK IE FB will be supported soon.



# With a verification function inside, the verified result can be communicated to the host device as data.

\* If the verification function is not used, a communication error will occur if the result is not sent back to the RFID main unit.



## Manage user authority for machines and devices

**BEFORE** 

Anyone can operate the machines.



**AFTER** 

Inadvertent operation and setting changes are prevented, reducing equipment malfunctions and failures.

Mount the RFID reader on the operation panel of a machine and register the workers in the RFID reader. ID cards can then be used to authenticate each worker.



## Track entry/exit at work areas

BEFORE

Do not know if workers are left inside.



AFTER

By recording entry/exit logs, workers can be prevented from being trapped or left behind in a work area.

Worker's names are linked to ID cards such as employee ID cards, and that data is sent when a card is read. Logs are recorded on the host device to track entry/exit.



## Manage inspection history

**BEFORE** 

Inspection reports were written by hand.



#### AFTER

After inspection work, employee ID cards are read and data is recorded.

Inspection details are recorded as electronic data and linked to worker data. The time and work details are recorded on a touch panel or PLC to ensure reliable traceability.





## **Configuration Tool** KW RFID Configurator

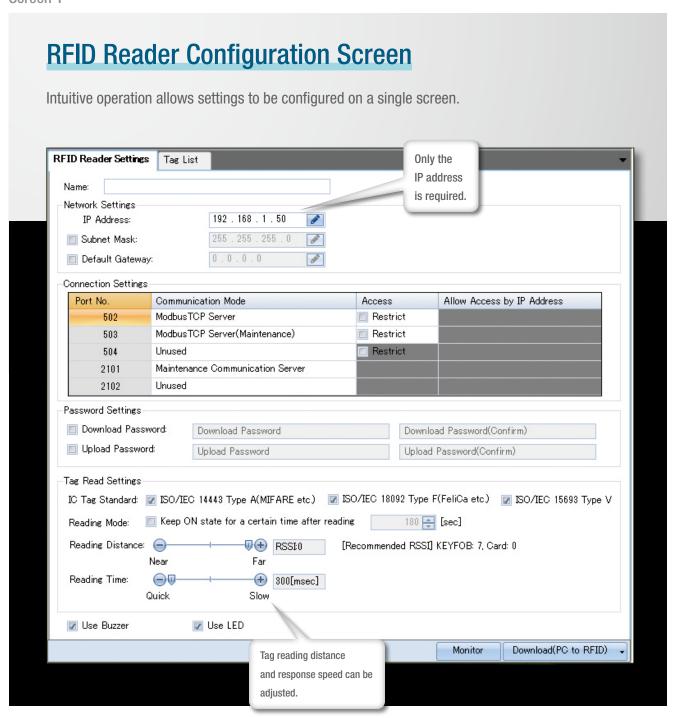
#### **Operating Environment**

Item	Details
0S	Windows10
CPU	1.0GHz or more
Memory	1GB or more
Environment	Microsoft.NET Framework4.0 or later



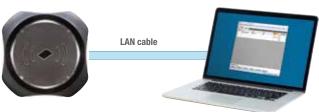
<sup>\*</sup> The configuration tool can be downloaded from the IDEC website

#### Screen 1

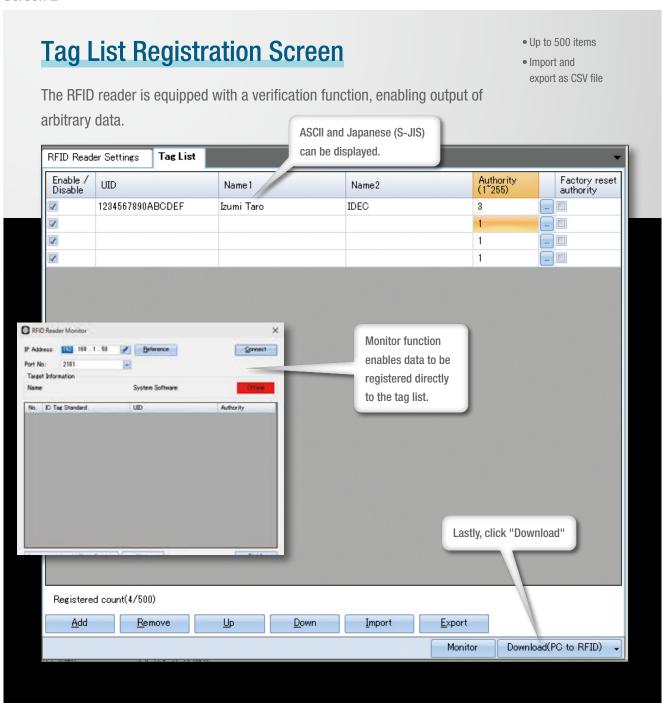


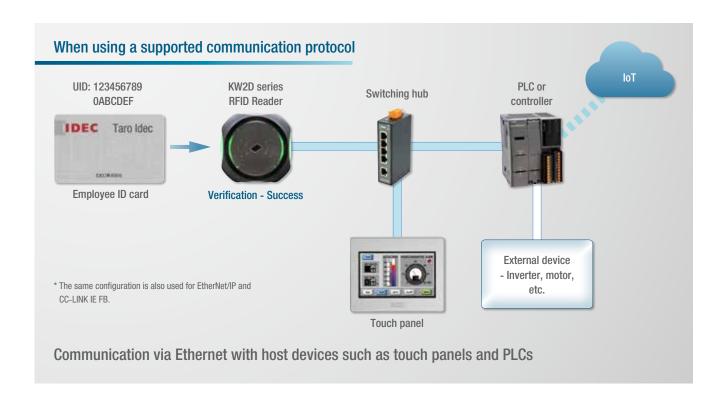
#### **Connection diagram**

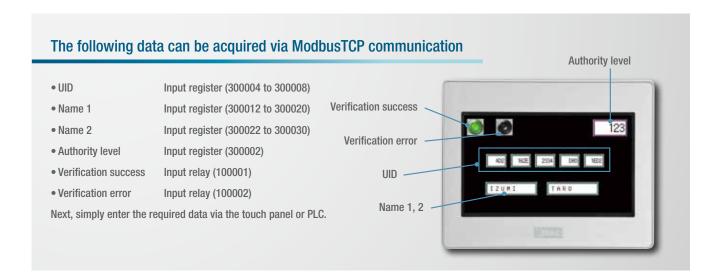
\* Connect to a computer when configuring settings.



#### Screen 2







Supported character codes

UTF-8, ASCII, Japanese (Shift-JIS), Chinese (GB2312), Western Europe (ISO 8859-1)

## **KW2D** Series Ø22 Smart RFID Reader

#### Compact RFID reader with integrated functions for the factory automation industry





With holder





Note: Approvals apply only to the main unit.

• For more information about certified products, see the IDEC website.

Main Unit Package Quantity: 1

Model	Appearance	Power Supply	Approval	Part No. (Ordering No.)
Without holder			IEC/EN61131-2 2007 (Zone B) EN301-489-3 UL61010-1/CAN/CSA C22.2	KW2D-R100Q4E
With holder		24V DC	No. 61010-1-12 UL 61010-2-201 EN50364	KW2D-RH100Q4E

#### **RFID Tags**

When ordering, specify the Ordering No.

Tag Type	Shape	Color	Part No. (Ordering No.)	Package Quantity
		Green	KW9Z-T1X1G	1
	69	Yellow	KW9Z-T1X2Y	1
KEYF0B	Dor	Red	KW9Z-T1X3R	1
	COEC .	Blue	KW9Z-T1X4S	1
		Black	KW9Z-T1X5B	1
Card	[]DEC	N/A	KW9Z-T2X0	2

#### **Maintenance Parts**

When ordering, specify the Ordering No.

ivialitieilalice Falts					when ordering, specify the Ordering No.
Name/Appearance	Specification/Dimension	Part No.	Ordering No.	Package Quantity	Remarks
Cover (withot holder)	For KW2D-R	KW9Z-CV	KW9Z-CV	1	
Cover (with holder)	For KW2D-RH	KW9Z-CVH	KW9Z-CVH	1	
Gasket	Rubber (black) Nitrile rubber	HW9Z-WM	HW9Z-WMPN10	10	t 0.5
Locking Ring	Polyamide resin (black)	CW9Z-LN	CW9Z-LNPN05	10	
Locking Ring Wrench	Metal (brass/nickel-plated) Weigh: Approx. 150g	MW9Z-T1	MW9Z-T1	1	Used to tighten the locking ring when mounting onto a panel.      110      08

#### **General Specifications**

	Rated Inpu	ıt Voltage	24V DC	
lm	Power Fluc	ctuation Range	20.4 to 28.8V DC (incl. ripples)	
lect	Power Consumption		2.4W maximum (24V DC)	
rica	Rated Insulation Voltage		50V DC	
<b>Electrical Specifications</b>	Allowable Momentary Power Interruption		1ms (at rated power supply voltage)	
fica	Withstand	Voltage	500V AC, 1 minute	
tions	Insulation Resistance		$100 M\Omega$ or higher (500V DC insulation resistance tester)	
	Inrush Cur	rent	25A maximum	
	Operating	Temperature	-25 to +55°C (no freezing)	
野	Storage Te	mperature	-40 to +80°C (no freezing)	
viro	Operating	Humidity	10 to 95% RH (no condensation)	
lme	Storage Hu	umidity	10 to 95% RH (no condensation)	
nta		Front Unit (*2)	IP65/67 (IEC60529)	
<b>Environmental Specifications</b>	Protection (*1)	Back Unit	IP20 (IEC60529)	
ficatio	Impact Test (*1)	Front Unit (*2)	5J (Equal to IK08)	
ns	Corrosion	Resistance	No corrosive gas	
	Operating	Environment	Indoors	
	Vibration F	Resistance	5 to 55Hz, amplitude 0.5mm, on 3 mutually perpendicular axes	
	Shock Res	istance	100m/s², 11ms, six directions on 3 mutually perpendicular axes	
	Power	Wire Pull Force	AWG24: 10N maximum AWG22: 15N maximum AWG20: 20N maximum AWG18: 30N maximum AWG16: 40N maximum	
Mecha	Supply Terminal	Insertion/Removal Durability	25 times minimum	
Mechanical Specifications		Recommended Operation Force of Pusher	20N (40N maximum)	
ificatio	Tag Holder	Insertion/Removal Durability	10,000 times minimum	
)ns	Indicators		LED colors (red: 2, green: 2 white: 4)	
	Buzzer		Single tone	
	PCB		FR, 94V-0	
	Coos	Front Cover Back Cover	PBT	
	Case Materials	Front Base Back Base	PA66	
		Lens	PCT	
	Weight (Ap	prox.)	70g	
*1 ID	norformana	and IV ratings are not	subject to III, certification	

<sup>\*1</sup> IP performance and IK ratings are not subject to UL certification.

#### **Ethernet Communication Specifications**

Communication		Ethernet
Electrical Char	racteristics	IEEE802.3 compliant
	Connector	RJ45
	Pull Force	15N
Connector	Insertion/ Removal Durability	100 times minimum
Transmission	Speed	10BASE-T, 100BASE-TX
Communication Functions		Modbus TCP Server
Cable		CAT.5 STP, with a maximum length of 100m

#### **RFID Interface Specifications**

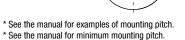
· .			
Communication Standards		ISO/IEC14443 Type A (Type A), ISO/IEC18092 (Type F), JIS X6319-4 (Type F), ISO/IEC 15693 (Type V)	
	Type F (Felica)	212kbps	
Communication Speed	Type A (Mifare)	106kbps	
	Type V (I-CODE)	26.5kbps	
Carrier Frequer	ıcy	13.56MHz (HF band)	
Wireless Standards	Countries	Japan, United States, Canada, EU, China, Taiwan (Planned support: India, Thailand)	
Supported	Card Type	ISO/IEC14443 Type A, ISO/IEC18092, JIS X6319-4, ISO/IEC15693	
Tags (*1)	KEYFOB Type	ISO/IEC14443 Type A	
Card Tag Reading Type		0 to 15mm	
Distance (*2)	KEYFOB Type	0 to 5mm	
Tag Reading Po	sition (*3)	Center of tag stationary in center of front unit	
Tag Reading Time		300 to 3000 [msec] (adjustable with [Reading Time] in the KW RFID Configurator)	

<sup>\*1</sup> Multiple tags cannot be read.

#### **Mounting Hole Layout**

Drill a mounting hole in the panel with the dimensions shown in the

following diagram.



#### **RFID Tag Specifications**

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Applicable	Card	ISO/IEC14443 Type A	
Standard	KEYFOB	130/1EG14443 Type A	
Operating	Card	0°C to 50°C	
Temperature	KEYFOB	-25°C to 55°C	
Storage	Card	-20°C to 50°C	
Temperature	KEYFOB	-25°C to 75°C	
Operating	Card	20% RH to 90% RH or less	
Humidity	KEYFOB	60% RH or less	
Storage	Card	90% RH or less	
Humidity	KEYFOB	60% RH or less	
Reading	Card	0 to 10mm	
Distance	KEYFOB	0 to 5mm	
Operating Environment		Indoors	

<sup>\*2</sup> Front of the panel only.

<sup>\*2</sup> The tag reading distance is a value that was measured using the tags listed in "Names of LSIs in Tested Tags" (on page 2-3 of the User's Manual) that IDEC has tested. The tag reading distance will vary depending on the tag that is actually used and the operating environment.

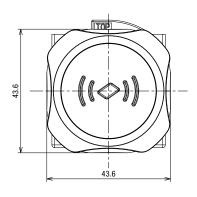
<sup>\*3</sup> The tag reading position is the value using a standard IDEC tag placed near the center of the reader. The tag reading distance changes with the tag and operating environment.

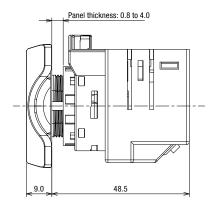
(Units: mm)

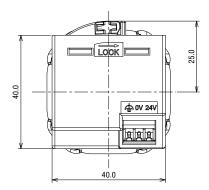
#### Dimensions

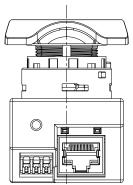
#### **Main Unit**

#### Without holder: KW2D-R100Q4E

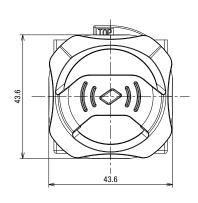


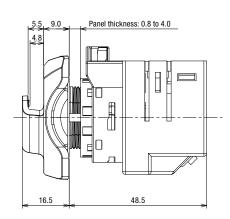


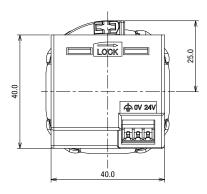


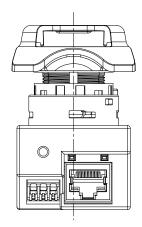


#### With holder: KW2D-RH100Q4E





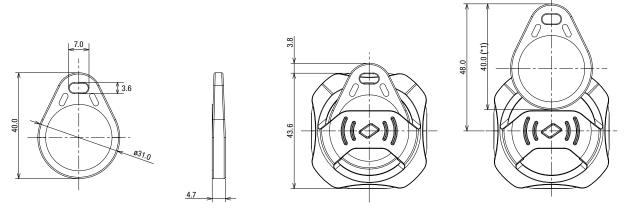




Dimensions (Units: mm)

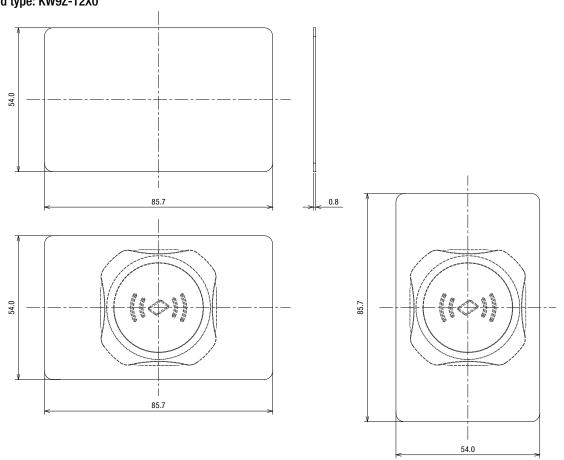
Tag

KEYFOB type: KW9Z-T1X1G, KW9Z-T1X2Y, KW9Z-T1X3R, KW9Z-T1X4S, KW9Z-T1X5B

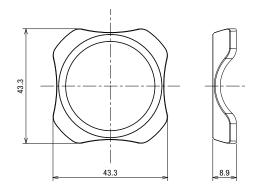


<sup>\*1</sup> Minimum size with KEYF0B attached.

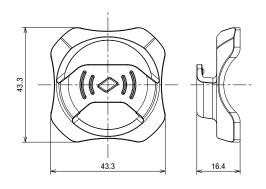
#### Card type: KW9Z-T2X0



#### Cover KW9Z-CV



#### KW9Z-CVH



#### Safety Precautions

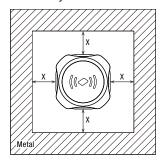
 Be sure to turn off the power before starting installation, removal, wiring, maintenance, and inspection work. Failure to turn power off may cause electrical shocks or fire hazard.

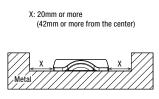
#### **Precautions for Use**

#### **Installation and Wiring Precautions**

#### **Installation Space**

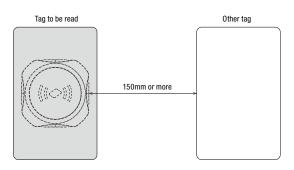
Metal around the front unit will affect the reading distance of RFID tags. If the front unit is surrounded with metal, separate the metal from the front unit by 20mm or more.





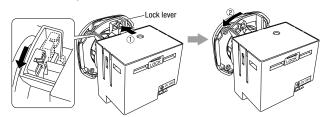
#### When Multiple Tags Are in the Reading Area

The wrong tag may be detected. Keep tags that should not be read 150mm or more from the area around the front unit.



#### Removing the Back Unit

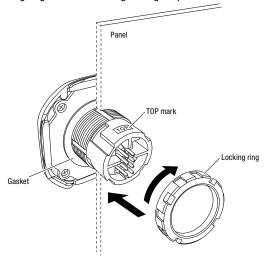
1) To remove the back unit from the front unit, press the lock lever (①) while turning it to the left.



2) To attach the back unit, align the TOP marks on the front unit and the back unit, and then insert the back unit into the front unit. Turn the lock lever to the right to lock it.

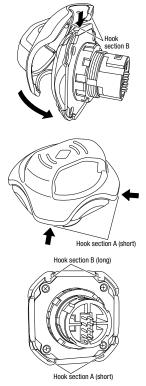
#### **Panel Mounting Method**

Insert the front unit into the mounting hole from the front side of the panel, and install the locking ring from the back side of the panel. Locking ring recommended tightening torque: 2.0N·m



#### Attaching the Front Cover

- 1) Attach hook section B (long) of the front cover to the front unit.
- 2) Push hook section A (short) onto the front unit.
- 3) The cover (without holder) and cover (with holder) are installed in the same way.



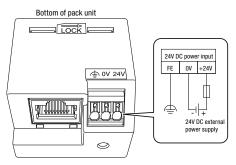
The front cover can be attached with a pitch of 90°.

#### Instructions

#### **Applicable Wire**

#### **Power Supply Wiring**

- The KW2D Series RFID Reader has a push-in style terminal block.
- An inrush current of 25A or lower (when input is 24V DC) flows when the power is turned on. Use a power supply with sufficient capacity.
- To prevent induction, keep the power line as short as possible, and as far away as possible from motor lines.
- The following table shows the signals that correspond to the signal codes. Be careful not to mistake the connections.



Label/Symbol	Signal Wire
24V	Power supply (+24V)
0V	Power supply (0V)
<u></u>	Functional ground (FE)

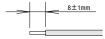
When wiring, use the applicable wires shown below.

#### **Applicable Wire and Specifications**

Applicable Wire	0.25 to 1.5mm <sup>2</sup> (AWG16 to 24)
Wire Strip Length (*1)	8 ± 1mm (*2)
Ferrule Size	H0.5 to H1.5 (without insulated cover)
(*1)	H0.25 to H0.75 (with insulated cover)

 $<sup>^{\</sup>star}1$  For details on ferrules, see the "Wire Size and Recommended Ferrules" table below.

Note: Make sure that the stranded wires do not loosen when using wiring without ferrules.



#### Wire Size and Recommended Ferrules

#### Ferrules without insulated covers

Applicable Wire (Stranded Wire)		Wire Strip Length	Weidmüller Recommended
AWG	mm <sup>2</sup>	Lengui	Part No.
20	0.50	10 to 11mm	H0.5/10
18	0.75	10 to 11mm	H0.75/10
17	1.00	10 to 11mm	H1.0/10
16	1.50	10 to 11mm	H1.5/10

#### Ferrules with insulated covers

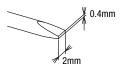
Applicable Wire (Stranded Wire)		Wire Strip Length	Weidmüller Recommended
AWG	mm <sup>2</sup>	Lengui	Part No.
24	0.25	10 to 11mm	H0.25/12 HBL
22	0.34	10 to 11mm	H0.34/12 TK
20	0.50	10 to 11mm	H0.5/14 OR
20	0.50	10 to 11mm	H0.5/14S OR
20	0.50	10 to 11mm	H0.5/14S W
18	0.75	10 to 11mm	H0.75/14 W

<sup>\*1</sup> UL wire compatible with insulated cover

#### **Recommended Tools (Optional)**

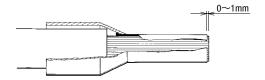
The following recommended tools can be used. The recommended tools are manufactured by Weidmüller.

Name		Weidmüller Recommended Part No.
Flat blade screwdriver	Normal type	SDS 0.4 × 2.5 × 75
	With insulated cover	SDS 0.4 × 2.5 × 75
Crimping tool		PZ6/5

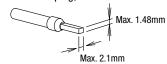


#### **Crimping of Ferrules and Wiring**

- Choose an appropriate ferrule for the wire.
- Cut the wire carefully to get a flat end.
- Make sure that ferrule sleeve is completely filled by the conductor.
   Depending on the cross section, the conductor should protrude approx. 0 to 1mm from the ferrule sleeve.

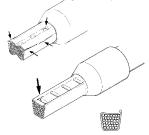


• When crimping, refer to the instructions of the crimping tool.



#### Faults which can occur during crimping:

- Cracks along the sides and die impressions
- Splitting of the ferrules
- Asymmetrical crimping shape
- Extreme burrs formed along the sides
- Ferrule not filled by conductor
- · Single conductors pushed back by protruding from the insulated cover
- Single conductors squeezed off
- · Insulation cover damaged by the crimping jaw
- · Conductor insulation not pushed into the insulated cover
- · Ferrule bent longitudinally after crimping



Formation of cracks at the sides, sides split open

Formation of cracks at the impressions of the crimping jaw

Asymmetrical crimping shape, burr formation on one side



Asymmetrical crimping shape, burr formation on one side



Single conductor squeezed off



Single conductor protruding

<sup>\*2</sup> Strip the sheath of the wire 8±1mm from the end.

#### **Ordering Terms and Conditions**

Thank you for using IDEC Products.

By purchasing products listed in our catalogs, datasheets, and the like (hereinafter referred to as "Catalogs") you agree to be bound by these terms and conditions. Please read and agree to the terms and conditions before placing your order.

#### 1. Notes on contents of Catalogs

- (1) Rated values, performance values, and specification values of IDEC products listed in this Catalog are values acquired under respective conditions in independent testing, and do not guarantee values gained in combined conditions.
  - Also, durability varies depending on the usage environment and usage conditions.
- (2) Reference data and reference values listed in Catalogs are for reference purposes only, and do not guarantee that the product will always operate appropriately in that range.
- (3) The specifications / appearance and accessories of IDEC products listed in Catalogs are subject to change or termination of sales without notice, for improvement or other reasons.
- (4) The content of Catalogs is subject to change without notice.

#### 2. Note on applications

- If using IDEC products in combination with other products, confirm the applicable laws / regulations and standards.
  - Also, confirm that IDEC products are compatible with your systems, machines, devices, and the like by using under the actual conditions. IDEC shall bear no liability whatsoever regarding the compatibility with IDEC products.
- (2) The usage examples and application examples listed in Catalogs are for reference purposes only. Therefore, when introducing a product, confirm the performance and safety of the instruments, devices, and the like before use. Furthermore, regarding these examples, IDEC does not grant license to use IDEC products to you, and IDEC offers no warranties regarding the ownership of intellectual property rights or non-infringement upon the intellectual property rights of third parties.
- (3) When using IDEC products, be cautious when implementing the following.
  - i. Use of IDEC products with sufficient allowance for rating and performance
  - Safety design, including redundant design and malfunction prevention design that prevents other danger and damage even in the event that an IDEC product fails
  - Wiring and installation that ensures the IDEC product used in your system, machine, device, or the like can perform and function according to its specifications
- (4) Continuing to use an IDEC product even after the performance has deteriorated can result in abnormal heat, smoke, fires, and the like due to insulation deterioration or the like. Perform periodic maintenance for IDEC products and the systems, machines, devices, and the like in which they are used.
- (5) IDEC products are developed and manufactured as general-purpose products for general industrial products. They are not intended for use in the following applications, and in the event that you use an IDEC product for these applications, unless otherwise agreed upon between you and IDEC, IDEC shall provide no guarantees whatsoever regarding IDEC products.
  - i. Use in applications that require a high degree of safety, including nuclear power control equipment, transportation equipment (railroads / airplanes / ships / vehicles / vehicle instruments, etc.), equipment for use in outer space, elevating equipment, medical instruments, safety devices, or any other equipment, instruments, or the like that could endanger life or human health
  - ii. Use in applications that require a high degree of reliability, such as provision systems for gas / waterworks / electricity, etc., systems that operate continuously for 24 hours, and settlement systems
  - iii. Use in applications where the product may be handled or used deviating from the specifications or conditions / environment listed in the Catalogs, such as equipment used outdoors or applications in environments subject to chemical pollution or electromagnetic interference If you would like to use IDEC products in the above applications, be sure to consult with an IDEC sales representative.

#### 3. Inspections

We ask that you implement inspections for IDEC products you purchase without delay, as well as thoroughly keep in mind management/maintenance regarding handling of the product before and during the inspection.

#### 4. Warranty

(1) Warranty period

The warranty period for IDEC products shall be one (1) year after purchase or delivery to the specified location. However, this shall not apply in cases where there is a different specification in the Catalogs or there is another agreement in place between you and IDEC.

#### (2) Warranty scope

Should a failure occur in an IDEC product during the above warranty period for reasons attributable to IDEC, then IDEC shall replace or repair that product, free of charge, at the purchase location / delivery location of the product, or an IDEC service base. However, failures caused by the following reasons shall be deemed outside the scope of this warranty.

- i. The product was handled or used deviating from the conditions / environment listed in the Catalogs
- ii. The failure was caused by reasons other than an IDEC product
- iii. Modification or repair was performed by a party other than IDEC
- iv. The failure was caused by a software program of a party other than IDEC.
- v. The product was used outside of its original purpose
- Replacement of maintenance parts, installation of accessories, or the like was not performed properly in accordance with the user's manual and Catalogs
- vii. The failure could not have been predicted with the scientific and technical standards at the time when the product was shipped from IDEC
- viii. The failure was due to other causes not attributable to IDEC (including cases of force majeure such as natural disasters and other disasters)

  Furthermore, the warranty described here refers to a warranty on the IDEC

Furthermore, the warranty described here refers to a warranty on the IDEC product as a unit, and damages induced by the failure of an IDEC product are excluded from this warranty.

#### 5. Limitation of liability

The warranty listed in this Agreement is the full and complete warranty for IDEC products, and IDEC shall bear no liability whatsoever regarding special damages, indirect damages, incidental damages, or passive damages that occurred due to an IDEC product.

#### 6. Service scope

The prices of IDEC products do not include the cost of services, such as dispatching technicians. Therefore, separate fees are required in the following cases.

- Instructions for installation / adjustment and accompaniment at test operation (including creating application software and testing operation, etc.)
- (2) Maintenance inspections, adjustments, and repairs
- (3) Technical instructions and technical training
- (4) Product tests or inspections specified by you

The above content assumes transactions and usage within your region. Please consult with an IDEC sales representative regarding transactions and usage outside of your region. Also, IDEC provides no guarantees whatsoever regarding IDEC products sold outside your region.

For details on installation, wiring, and maintenance, see the Instruction Sheet and User's Manual from the URL below.

URL: https://product.idec.com/?product=KW2D



IDEC recommends the use of the RFID reader with the following products.

#### Flush Silhouette Switches

USB/RJ45 Relay Ports

#### **Ethernet Switches**

**Smart Relays** 

PLCs/Controllers

CW





Projects only 2mm from the panel. Ideal for panels that require cleanliness and safety.





Rugged design. Suitable for a range of applications. **Unmanaged Ethernet switches** equipped with various features.

FL1F



PLCs/Controllers/Operator Interfaces

Equipped with convenience and high functionality. Multiple power supply variations.

FC6A Plus/All-in-One



FC6A Plus is ideal for controlling not only large-size machines, but also entire small-size production lines. FC6A All-in-One has high performance and easy programming features.

PLC / Controllers

Operator Interfaces

Interlock Switches

Safety Switch

FT1A Touch



Built-in LCD enables control and display with high visibility.

**HG Series** 



Excellent visibility by super-bright LED backlight. Withstands harsh environments.

HS5L



Interlock switch with solenoid. 2-contact: ideal for use on applications such as food machines and injection molding machines. 4-contact: ideal for use on limited mounting spaces such as small doors

HS1T



Interlock switch with solenoid. Ideal for use on large doors and large equipment requiring strong locking force (5000N). Equipped with head rotating structure.

## **IDEC CORPORATION**



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