



BKT AL200

Electronic locking & monitoring swinghandle

with mechanical override

- user manual
- version 3



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1 Introduction

1.1 General information

Warning:

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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1.2 Device characteristics

The AL200 is an electronic swinghandle for ICT cabinets. It allows opening of cabinet doors in a standard mechanical way and by electrical remote control. It can operate with any access control system. Together with optional card reader it can also work as a stand-alone access control system. Thanks to the installed cylinder, it is also possible to open it in an emergency with a key.

Basic features:

- Possibility to work autonomously or in the access control system.
- Two connectors providing control and status signals of the handle and for the optional fid card reader.
- Equipped with the optical sensor of the handle position.
- Three-color LED signalling the operation status of the swinghandle.
- Emergency key override.
- Available inserts for the master key system.
- For use with indoor cabinets.
- Installation in a standard 150x25mm cut out.
- Can be installed in a single and multi-point locking system (requires additional elements - cam or cogwheel mechanism, which should be ordered separately).

1.3 Working modes

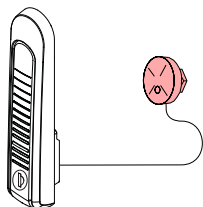
In the current version (manufacturing date from Q2 2022, see chapter 6 *Accessories*), the handle can work in one of three modes:

1. Standard mechanical handle



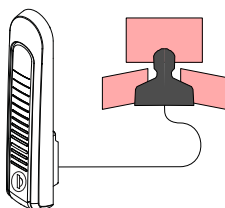
If the electronic opening functionality is not used, the handle works as a standard mechanical handle opened with a key. This solution is used when the cabinet is to be equipped with access control at a later time.

2. Stand-alone access control system



Any card reader or keyboard with Wiegand interface can be connected directly to the handle. The handle together with an optional reader creates an autonomous access control system. It is possible to assign 63 identifiers (cards or PIN codes) of users who will be able to open the handle. Read more in chapter 4 *Standalone mode*.

3. Work in the access control system



In this mode, the handle works only as an electronic mechanism that opens the cabinet. It is compatible with any access control system. The external access controller controls the opening of the handle. Information about the status of the handle (tilted/not tilted) can be transferred to the superior controller. Read more in chapter 5 *Operation mode in the access control system*.

2 Technical specifications

Handle data

Parameter	Value
Power supply voltage	Nominal 12V DC, allowed 10-24V DC, recommended power supply 12V DC $\geq 500\text{mA}$. If the handle powers an optional card reader, take into account the supply voltage and the current consumption of the reader.
Quiescent current consumption (not including optional card reader)	110 mA at 10 V 90 mA at 12 V 60 mA at 24 V
Maximum current consumption when opening/closing (200ms) (not including optional card reader)	300 mA at 10 V 250 mA at 12 V 150 mA at 24 V
Connectors	Type 53047-0810 8-pin connector, type 53047-0410 4-pin connector
Dimensions	177 x 37 x 51mm (H x W x D)
Weight	150g
Packaging dimensions	200 x 100 x 50 mm (W x D x H)
Packaging weight	200g
Operating conditions	Temperature: 0°C - 50°C, Humidity: 0% - 90% RH (without condensation)
Storage conditions	Temperature: -10°C - 60°C, Humidity: 0% - 95% RH (without condensation)
Enclosure material	Glass fibre reinforced polyamide PA6 GF30
Enclosure colour	Black, RAL 9005
Enclosure protection degree	IP30
Compliance with directives	2014/30/EU (EMC), 2011/65/EU (RoHS)
Compliance with standards	EN 61000-4-2:2009 Electrostatic discharge immunity test. EN 61000-4-3:2007 Radiated, radio-frequency, electromagnetic field immunity test EN 61000-4-4:2012 Electrical fast transient/burst immunity test. EN 61000-4-5:2014 Surge immunity test. EN 61000-4-6:2014 Immunity to conducted disturbances, induced by radio-frequency fields. EN 61000-6-4:2007/A1:2011 Electromagnetic compatibility (EMC) – Emission standard for industrial environments.
Part number	122AL002000

Optional AR221 reader data

Parameter	Value
Power supply voltage	Nominal 12V DC, allowed 6,5-30 V DC
Maximum current consumption	50mA
Working frequency	125kHz
Reading distance	4cm
Cable length	0.4m

Data for optional reader of any type

Parameter	Value
Reader type	The handle supports any type of reader that has a Wiegand interface. It can be a 125kHz card reader (Unique, HID Prox etc.), 13.56MHz cards (Mifare, HID iClass etc.), biometric reader, keyboard reader etc.
Supported communication interfaces	Wiegand 26bit - 66bit
Reader supply voltage	The handle has a connector for powering the reader. The reader is powered by the same voltage as the handle, so it is necessary to select the value of the supply voltage appropriate for the handle and also for the optional reader.
Maximum allowable power consumption by the reader	200mA

3 Assembly

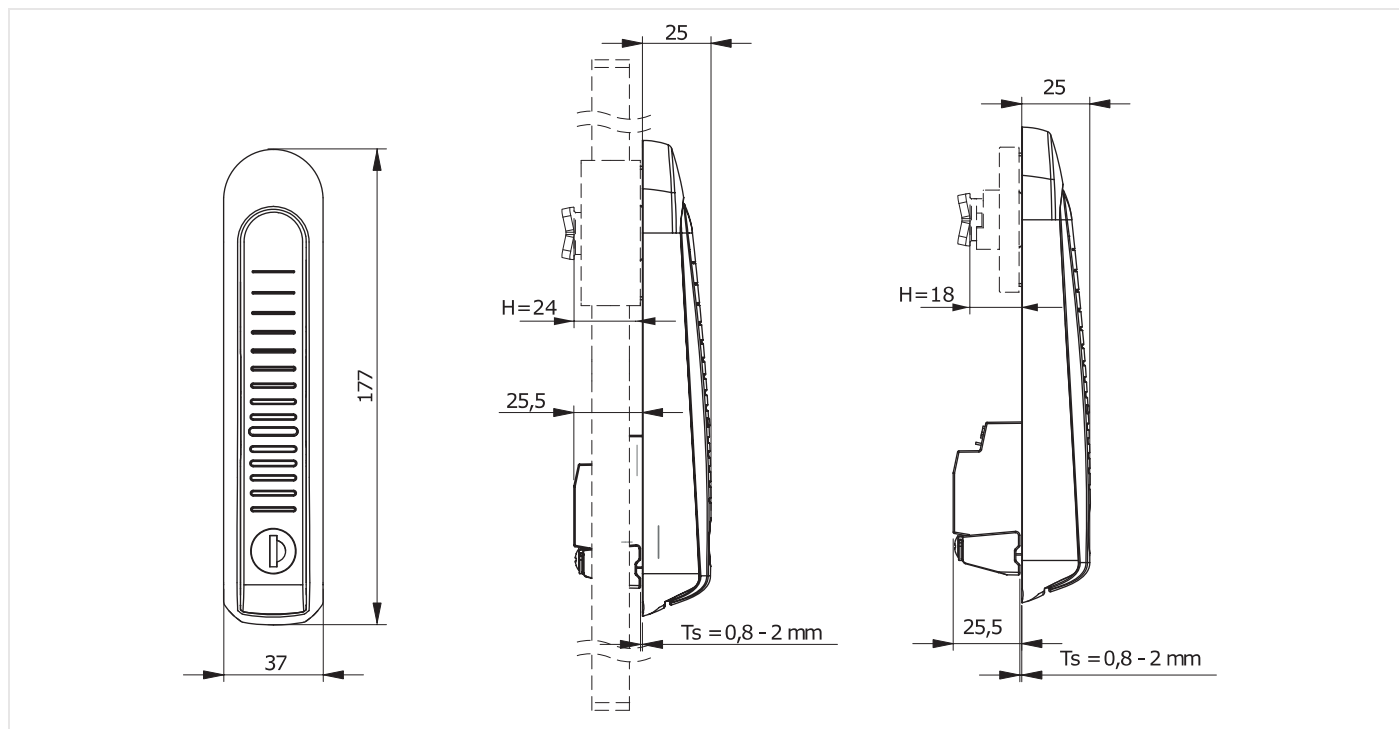
The swinghandle can work in a single-point system (only with a cam) or a multi-point system (with a cogwheel mechanism and a cam). The package does not contain all the mounting elements. Additional mounting elements dedicated to the respective cabinet must be ordered separately.

3.1 Package Contents

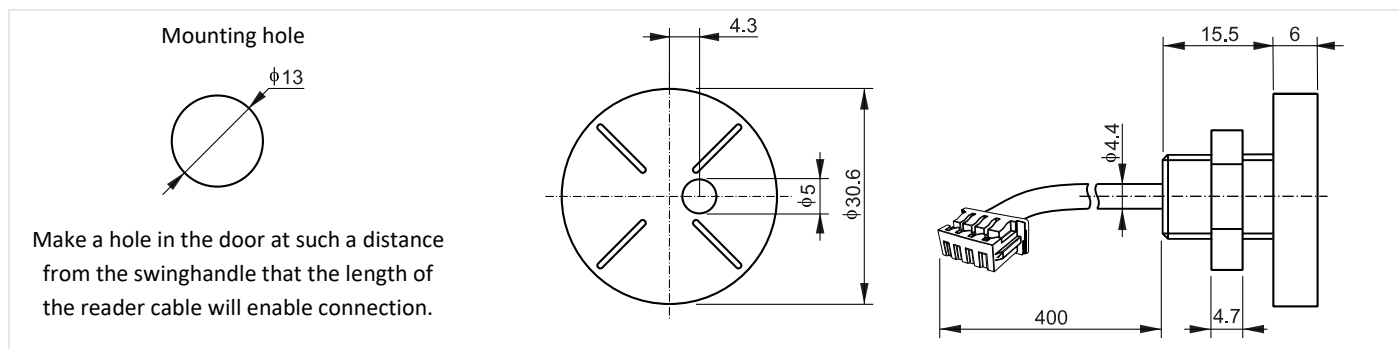
			
Packaging	AL200 swinghandle	Fastening element with screw	Quick Start Guide

3.2 Dimensions

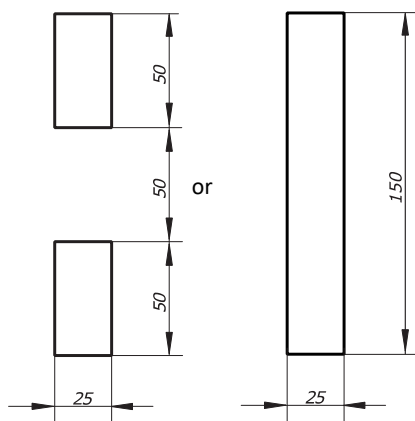
3.2.1 Swinghandle dimensions



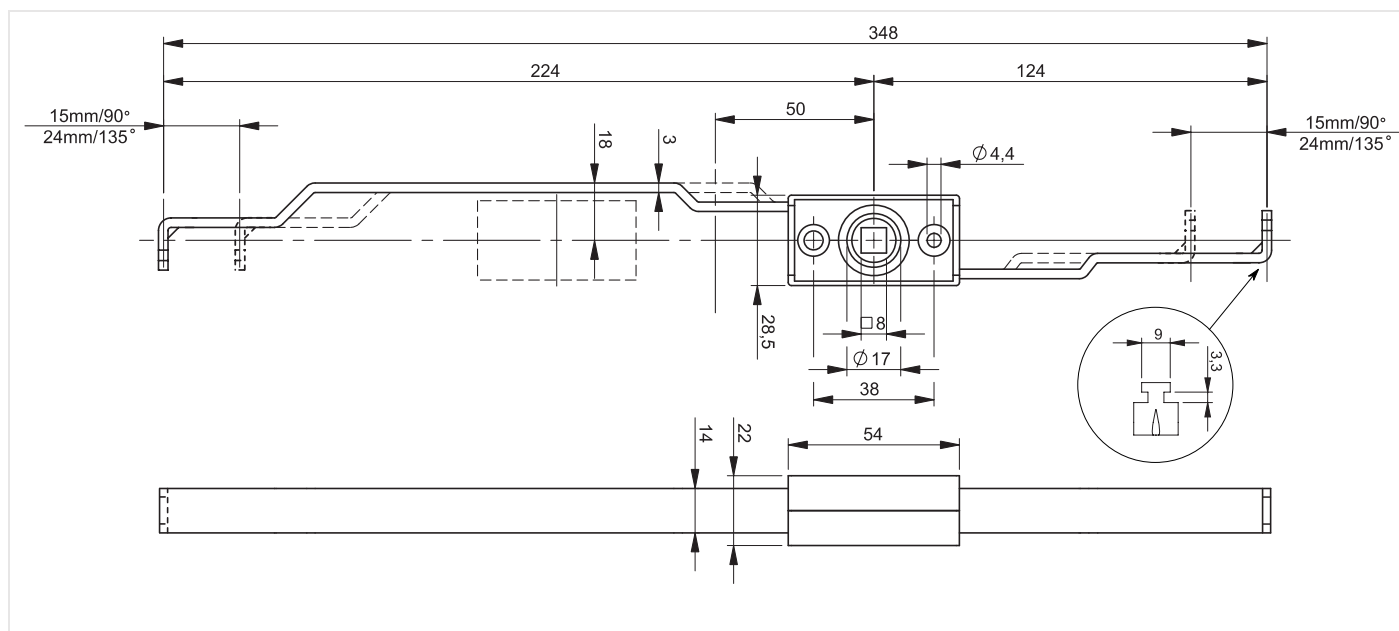
3.2.2 AR221 reader dimensions



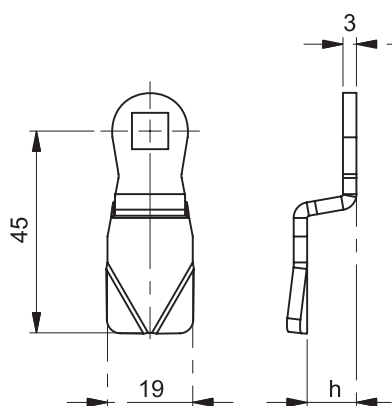
3.2.3 Cut out dimensions



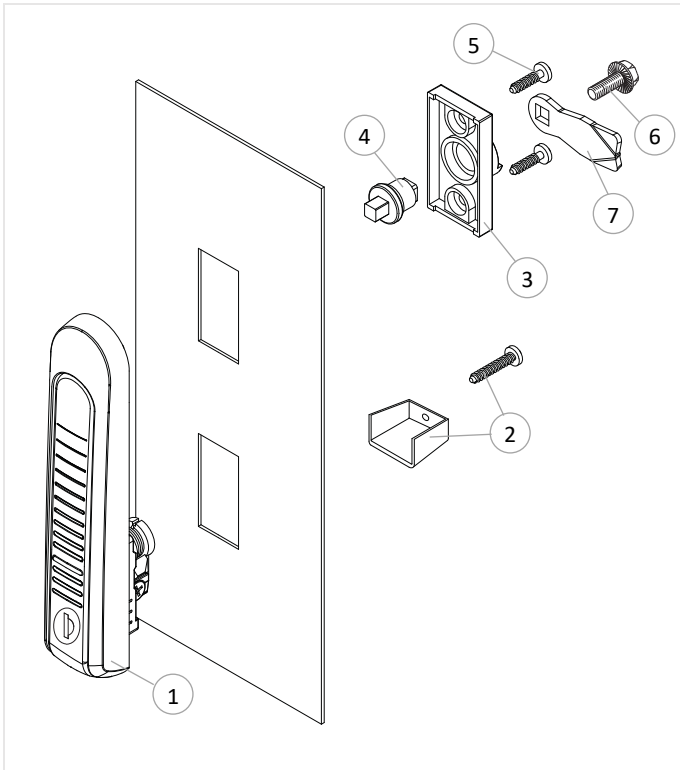
3.2.4 Cogwheel dimensions



3.2.5 Cam dimensions



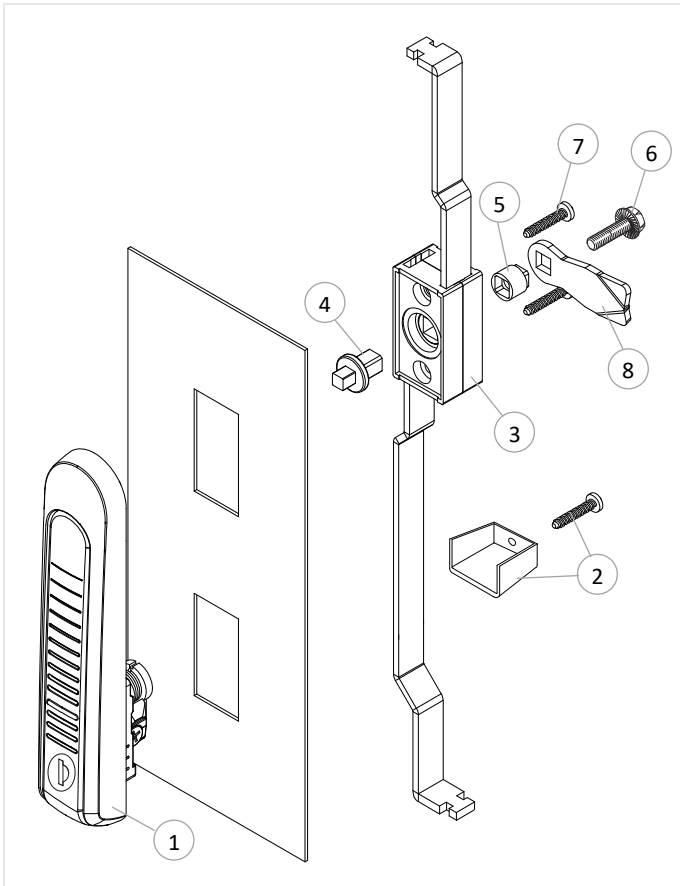
3.3 Single point assembly



1	122AL002000	AL200 swinghandle
2		Fastening element with screw
3	122AM002021	Cap
4	122AM002022	Cap adapter
5	122AM002023	Cap screw F4.1x12
6	122AM002024	Cam bolt M6x8
7	122AM002100	Cam h=0mm (locking height H=18mm)



3.4 Multi-point assembly

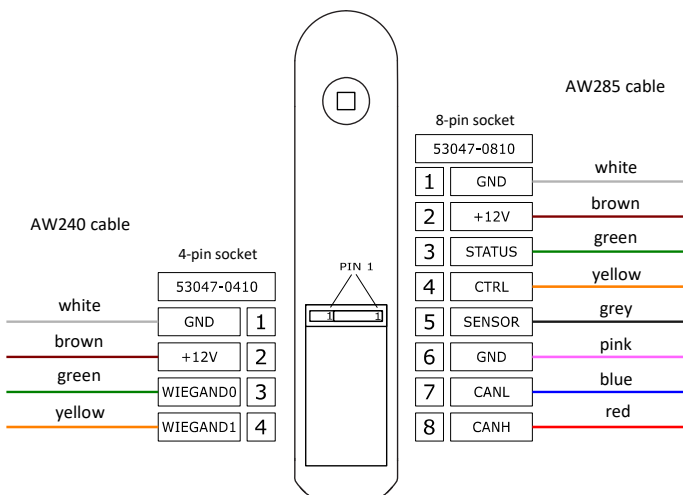
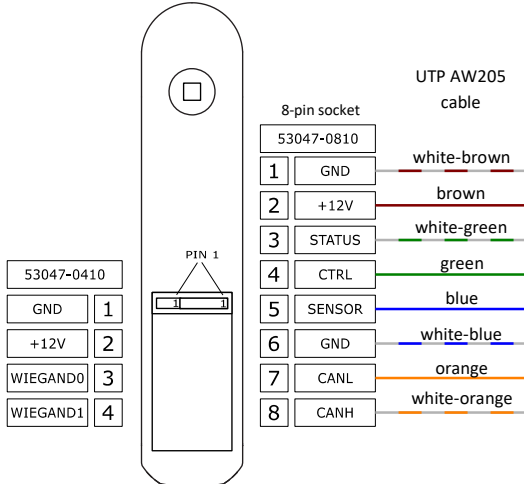


1	122AL002000	AL200 swinghandle
2		Fastening element with screw
3	122AM002001	Cogwheel mechanism
4	122AM002002	Cogwheel mechanism adapter
5	122AM002003	Bushing for cam
6	122AM002004	Cam bolt M6x16
7	122AM002005	Cogwheel screw F4.1x22
8	122AM002006	Cam h=0mm (locking height H=24mm)

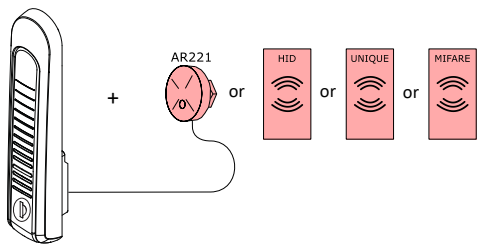


3.5 Connectors

The handle has two connectors: 8-pin and 4-pin. The 8-pin connector is the basic connector that provides power and control signals for the handle. The 4-pin connector is dedicated only to the optional card reader. The table below describes the individual pins of the connectors. The given colours apply to the LiYY type cable, eg AW285 and AW240 (see chapter 6 Accessories).

Connectors		
		8-pin socket type 53047-0810
	1	GND
	2	+12V
	3	STATUS
	4	CTRL
	5	SENSOR
	6	GND
	7	CANL
	8	CANH
		4-pin socket type 53047-0410 for rfid card reader
	1	GND
	2	+12V
	3	WIEGAND 0
	4	WIEGAND 1
		

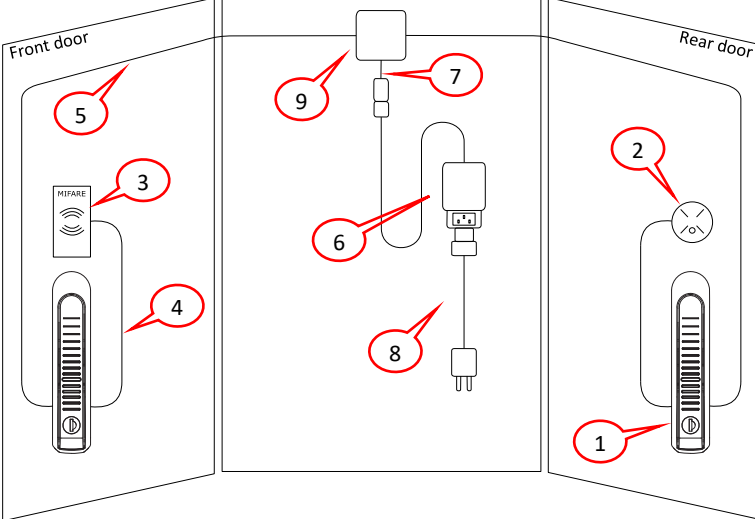
4 Standalone mode



A dedicated AR221 reader (see chapter 6 Accessories) or any other card reader with a Wiegand interface can be connected to the handle. A handle with a connected reader creates an autonomous access control system. It enables the assignment of 63 user IDs who will be able to open the handle. The process of assigning user cards is performed with the use of the master card. The process of creating a master card is described below. All card assigning procedures are performed without the use of a computer.

4.1 Connection

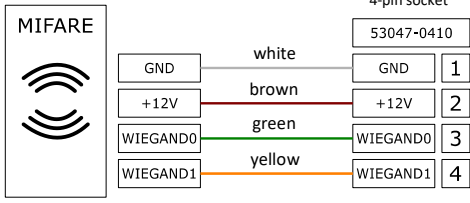
Connection diagram of two handles with readers in the cabinet



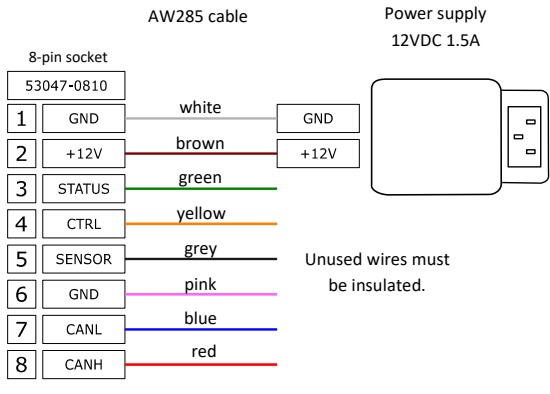
Devices used (see chapter 6 Accessories)		
1	AL200 swinghandle	122AL002000
2	AR221 card reader	122AR002210
3	Any reader with Wiegand interface	-
4	AW240 cable	122AW002400
5	AW285 cable	122AW002850
6	Power supply 12V 1.5A	122AA100015
7	DC power cord	122AA100016
8	AC power cord	11480784.2
9	Junction box	122AA100006

Connection diagram of the handle with the reader in standalone mode

Reader with Wiegand interface



AW285 cable

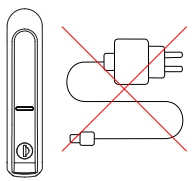
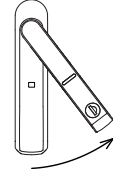
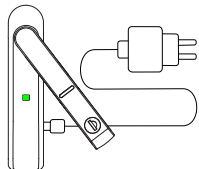
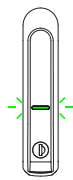
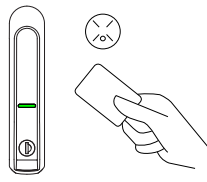
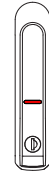


The handle 8-wire cable can be extended to a maximum length of 100m with selecting the appropriate cross-section of the wire. The maximum allowed length of the reader cable is 3m.

4.2 Master card programming

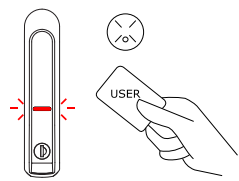
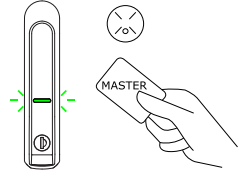
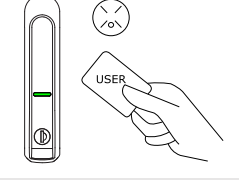
The master card is used for user card programming. It allows to add a new user or delete an existing one. Before programming, prepare a card suitable for a given type of reader. For the dedicated AR221 it is the EMC-1 card (see chapter 6 *Accessories*).

Note: Programming a new master card deletes all previously saved user cards.

Action	State after performing the action
1 Prepare a card that will be the master card.	
2 Disconnect the power from the handle.	
3 Open the handle with a key.	
4 Reconnect the power to the handle and wait 3 seconds until the green LED on the handle lights up continuously.	
5 Close the handle when the green LED is on, then the green LED will start blinking (2Hz). The green LED is on for 5 seconds. If the handle is not closed within this time, it will return to normal operation.	
6 Touch the prepared master card to the reader when the green LED is blinking. The green LED flashes for 5 seconds. Correct programming of the user card will be signalled by the green LED lighting for 2 seconds. The master card will be programmed and all user cards will be deleted. When the green diode is flashing and the master card is not applied, the handle will return to the normal operating state and the existing user cards will not be removed from the memory.	
7 Wait 3 seconds for the handle to restart. Keep the master card in a safe place.	

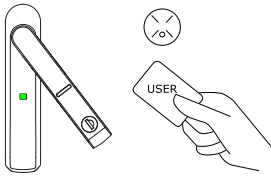
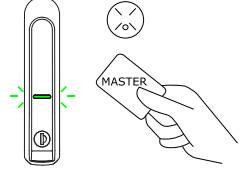
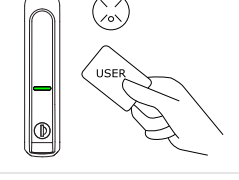
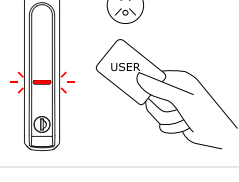
4.3 Adding new user card

The procedure saves to the memory the user card that will be able to open the handle.

Action	State after performing the action
1 Check if the user card has already been saved in the memory. Touching an unsaved card to the reader should cause the red LED to flash once.	
2 Touch the master card to the reader. The green LED should start blinking (2Hz) for 5 seconds.	
3 While the green LED is blinking, apply a new user card. Correct programming of the user card will be signalled by the green LED lighting for 2 seconds. If the red LED lights up for 2 seconds, it means that the user card memory is full. You must then remove a single card (see chapter 4.4 Removing user card) or delete all saved cards (see chapter 4.5 Removing all user cards).	

4.4 Removing user card

The procedure removes a single user card from memory. The removed card will not open the handle.

Action	State after performing the action
1 Check if the user card is already saved in the memory. Touching the written card to the reader should open the handle.	
2 Touch the master card to the reader. The green LED should start blinking (2Hz) for 5 seconds.	
3 While the green LED is blinking, touch the card to be removed from memory.	
4 Make sure the card does not open the handle anymore - the red LED should flash once.	

4.5 Removing all user cards

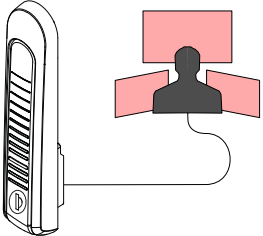
To remove all user cards, use the master card programming procedure (see chapter 4.2 Master card programming).

4.6 LED signalling

The handle has a three-color LED indicating the operating status. The basic operating states are summarized in the table below. The particular LED signalling is described in the individual master and user card programming procedures.

	LED state		Swinghandle working state
		Orange is on	The device is in programming mode.
		Orange blinking (1Hz)	The device is booting (within 3 seconds after connecting the power) or firmware error (if it blinks for more than 3 seconds).
		Red is on	The electric lock of the device is closed and handle is closed.
		Red blinking (1Hz)	The electric lock of the device is closed, but the handle is open.
		Green is on	The electric lock of the handle is open for 2 seconds after touching the authorized user card.

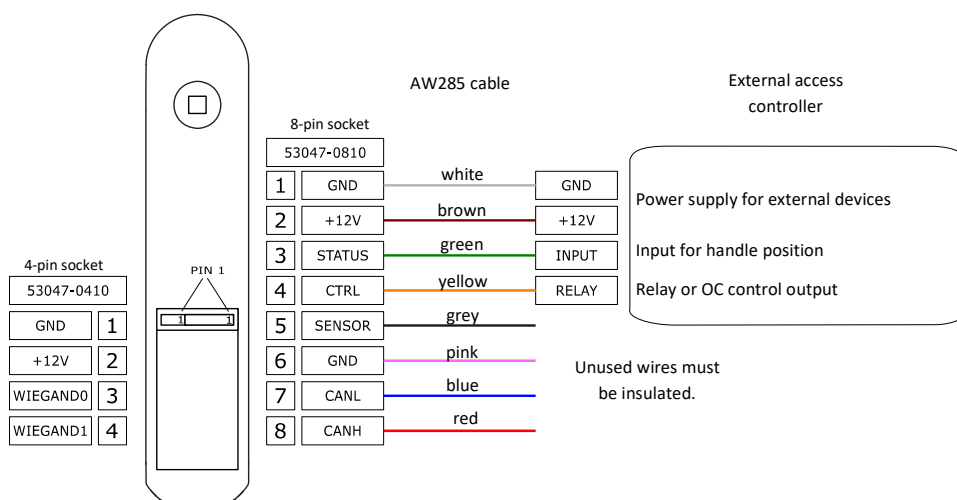
5 Operation mode in the access control system



The handle can work as only a cabinet door opening mechanism in a larger access control system. It can cooperate with any access control system, eg BKT ACS or any other company. The handle should be connected to the access controller that controls its operation. The handle can transmit information to the controller about the current position of the handle (tilted/not tilted).

5.1 Connection

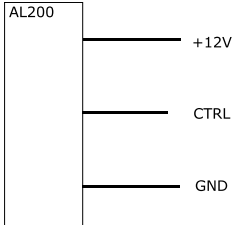
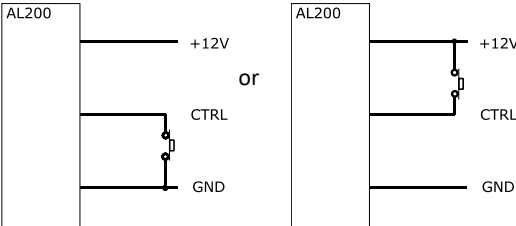
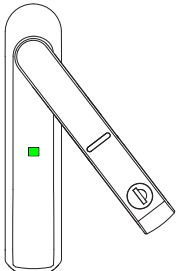
Connection diagram of the handle with the external access control system



The handle connection cable can be extended to a maximum length of 100m using eg. UTP cat.5e twisted pair.

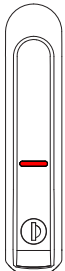
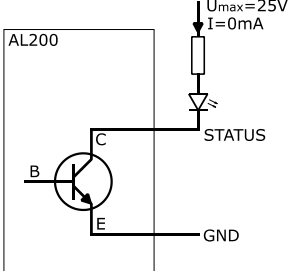
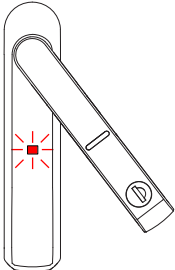
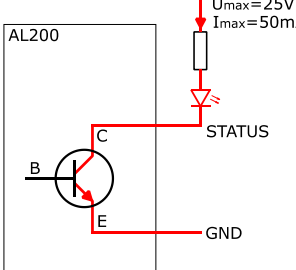
5.2 Electrical opening

Electric opening is made by shorting the CTRL input to the GND or +12V potential. If the CTRL input is not connected anywhere, then the swinghandle remains closed.

CTRL input state		Swinghandle lock status	
CTRL input not connected		Lock is closed	
CTRL input not connected to GND or +12V		Lock is open	

5.3 Handle position indication

The device has an optical sensor of the handle position, thanks to which this information can be transferred to an external access control system. The state of the STATUS output corresponds to the position of the handle. The STATUS output has overload protection. If the current through the transistor is greater than 50mA, the output will be turned off. The STATUS output will return to normal operation after removing the overload and changing the position of the handle.

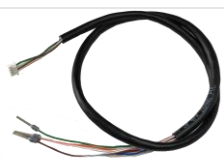
Position of the handle	STATUS output state		
	Handle closed		STATUS output inactive (NPN transistor is OFF)
	Handle open		STATUS output active (NPN transistor is ON)

5.4 LED signalling

The swinghandle has a three-color LED indicating the status of its operation.

LED state		Swinghandle working state	
		Orange is on	The device is in programming mode
		Orange blinking (1Hz)	The device is booting (within 3 seconds after connecting the power) or firmware error (if it blinks for more than 3 seconds)
		Red is on	The electric lock of the device is closed (no control on the CTRL input)
		Red blinking (1Hz)	The electric lock of the device is closed (no control on the CTRL input), but the handle is open.
		Green is on	The electric lock of the handle is open (controlled on the CTRL input)

6 Accessories

Product	Description	Part number
	AW285 - AL200 swinghandle 8-wire connection cable, length 5m; connectors: 1-plug, 2-ferrules	122AW002850
	AW240 - AL200 swinghandle 4-wire connection cable, length 0.5m; connectors: 1-plug, 2-ferrules	122AW002400
	AR221 - AL200 swinghandle Unique 125kHz card reader (RS-H3-05-M12)	122AR002210
	EMC-1 - UNIQUE EM 125 kHz thin proximity card	122AA101004
	GST18A12-P1J - Power supply 18W 12VDC 1.5A; AC socket C14; DC plug 5.5/2.1; no AC cord	122AA100015
	BKT AC power cord - socket IEC 320 C13 10A, plug DIN 49441(unischuko) 16A, 3 x 1,0 mm2 black 2m	11480784.2
	Cable with DC 5.5/2.1 inlet; straight; 0.5mm2; black; 3m	122AA100016

	Electrical junction box 86mm x 86mm x 39mm, wall mount, black, IP55	122AA100006
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7 Document revisions

Version	Changes	Date
1	Initial version.	March 2021
2	Updated 3.2, 3.3 and 3.4	July 2021
3	Support for rfid readers has been added for handles manufactured from 2Q2022. The device manufacturing date can be checked on the sticker. 	February 2022