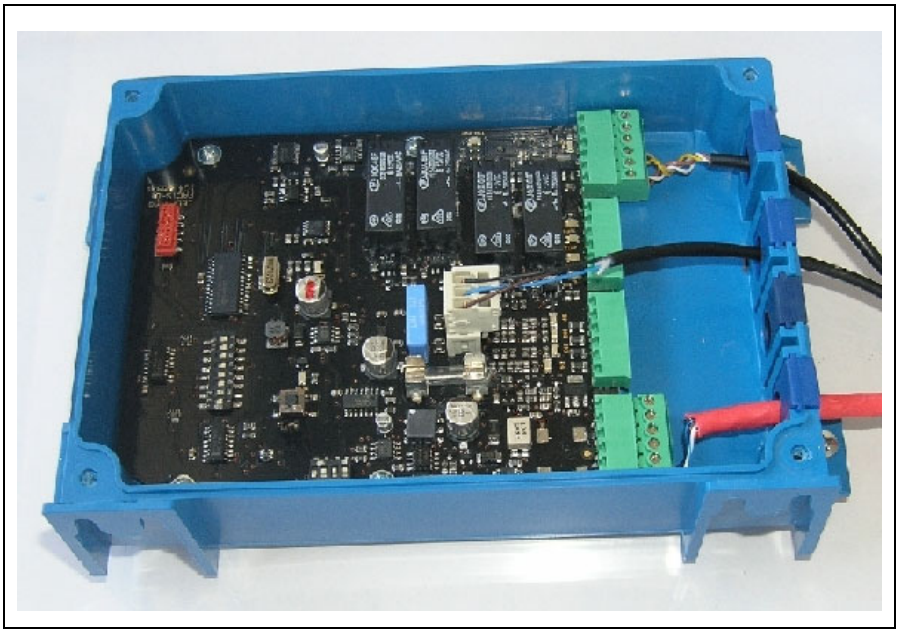
CEDES

Installation Manual

FACTS

Door Interface



English

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ISO 9001: 2000

IMPORTANT NOTE

FOLLOW THE INSTRUCTIONS GIVEN IN THIS MANUAL CAREFULLY. FAILURE TO DO SO MAY CAUSE CUSTOMER COMPLAINTS, INJURY, DEATH, AND / OR SERIOUS CALL BACKS. KEEP INSTRUCTION MANUAL ON SITE.

Part No. 104 657 En

IMPORTANT INFORMATION

DO NOT USE THIS PRODUCT IN EXPLOSIVE ATMOSPHERES, RADIOACTIVE ENVIRONMENTS OR FOR MEDICAL APPLICATIONS! USE ONLY SPECIFIC AND APPROVED DEVICES FOR SUCH APPLICATIONS OTHERWISE SERIOUS INJURY OR DEATH OR DAMAGE TO PROPERTY MAY OCCUR!

IT IS IN THE SOLE RESPONSIBILITY OF THE PLANNER AND/OR INSTALLER AND/OR BUYER THAT THIS PRODUCT IS USED ACCORDING TO ALL APPLICABLE CODES AND STANDARDS IN ORDER TO ENSURE SAFE OPERATION OF THE WHOLE APPLICATION.

ANY CHANGE OF THE DEVICE BY THE BUYER OR USER MAY RESULT IN AN UNSAFE CONDITION. CEDES DENIES EVERY LIABILITY AS WELL AS WARRANTY CLAIMS WHICH RESULT FROM SUCH MANIPULATION.

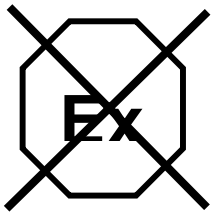

Table of Contents

1. System overview

FACTS is a flexible access control system with many applications. Whether you want to protect access to, or within, your company's facility or merely have a high-speed roller door automatically open – FACTS will do it all.

FACTS has been designed to manage access to buildings and facilities for companies with up to 2000 employees. One system can control up to 512 doors. In addition, FACTS can be used to control additional devices like shutters, windows, lights, etc.

FACTS is based on a new optical identification system with an optical sensor and a personal badge-key.

The web-based FACTS management software allows easy configuration of the access rights of each person. Each door access is automatically tracked by the system.

A reader and door interface is connected to the door-drive control unit of an automatic door or to the door-lock of a manually operated door or gate. If access is given by the FACTS system, the door interface activates the door-lock relay.

General purpose interfaces can be connected to automatic shutter drives to open and close the shutters via the FACTS management software.

All door interfaces and general purpose interfaces can be connected over a CAN-bus.

A FACTS system requires one set of FACTS management software with one USB-CAN-converter. But every component can also work independently as a stand-alone unit if no FACTS server is available.

1.1. Main features

- Infrared based, optical key identification
- Infrared light sensor system
- No radio frequency (RFID) emission
- Reading distance of up to 2.5 m
- Picture tracking at every door access
- Up to 512 door interfaces and general purpose interfaces connected over CAN bus
- Managing access rights for up to 2000 persons per system
- Offline and online operation
- Online monitoring of doors
- Web-based management software

1.2. Working principal

The reader has a defined detection area of 0.8 m by 0.8 m at a distance of 1.8 m. Within this field, a FACTS Key is detected and identified using infrared technology. Frequency radiation (i.e. RFID) is not used for the key reading.

This technique enables hands-free access through automatic doors and gates. Employees simply clip their FACTS Key onto clothing and as soon as they enter the detection area, they are identified. Depending on their access rights, the door will open or access will be refused.

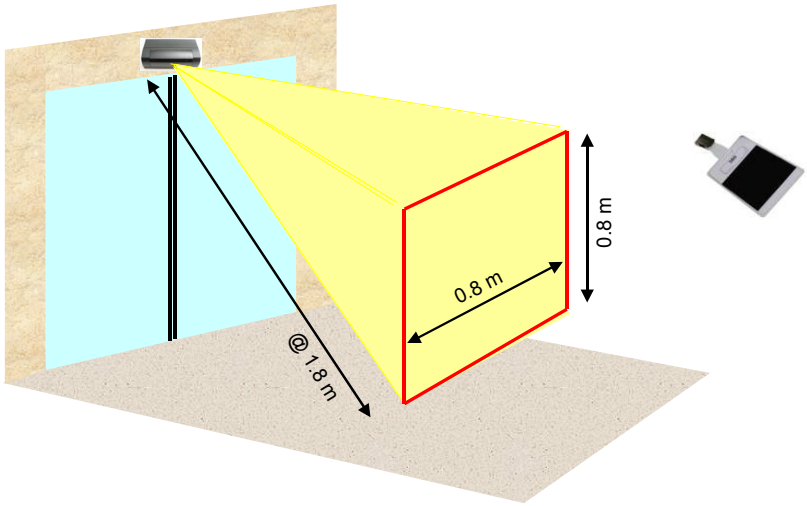

Figure 1: Reading distance

A reader and door interface is connected to the door-drive control unit of an automatic door or to the door-lock of a manually operated door or gate. If access is given by the FACTS system, the door interface activates the door-lock relay.

General purpose interfaces can be connected to automatic shutter drives to open and close the shutters via the FACTS management software.

1.3. Intended use

The FACTS system was designed to identify keys over a distance of up to 1.8 m. Under good conditions, even longer distances up to 2.5 m are possible. The system can be used to manage the access to doors and gates or to activate any other electrical device.

If the FACTS Keys are attached to trolleys, the system can also be used for goods tracking.

Attention:

The key is a passive identification medium without electronic components. The key identification method of the reader is based on an optical recognition of a pattern in the FACTS Key.

1.4. Ordering information

Part No.	Description
104 672	FACTS-25 Key Reader cpl.
104 654	FACTS Door Interface cpl.
104 660	FACTS General Purpose Interface cpl.
105 965	FACTS Management Software incl. USB-CAN Interface adapter
106 385	FACTS-25 Soft Key

2. Installation

2.1. General description

The Door Interface is the control unit which stores all access rights information. When the FACTS Key Reader recognizes a key, the identification number is sent to the Door Interface. According to the key list, the Door Interface gives access to the door and activates the door lock relay or refuses the access.

The Key Reader is connected and powered via a RS485 communication cable to the Door Interface. The Door Interface relay output is connected to the door drive control unit.

The Door Interface requires 24 VDC power and should be placed beside the door drive inside the door. The Key Reader is the only device outside the door. Since there is only a data communication to the reader, no relay wires from the cable can be shortcut to open the door.

2.2. Connection diagram

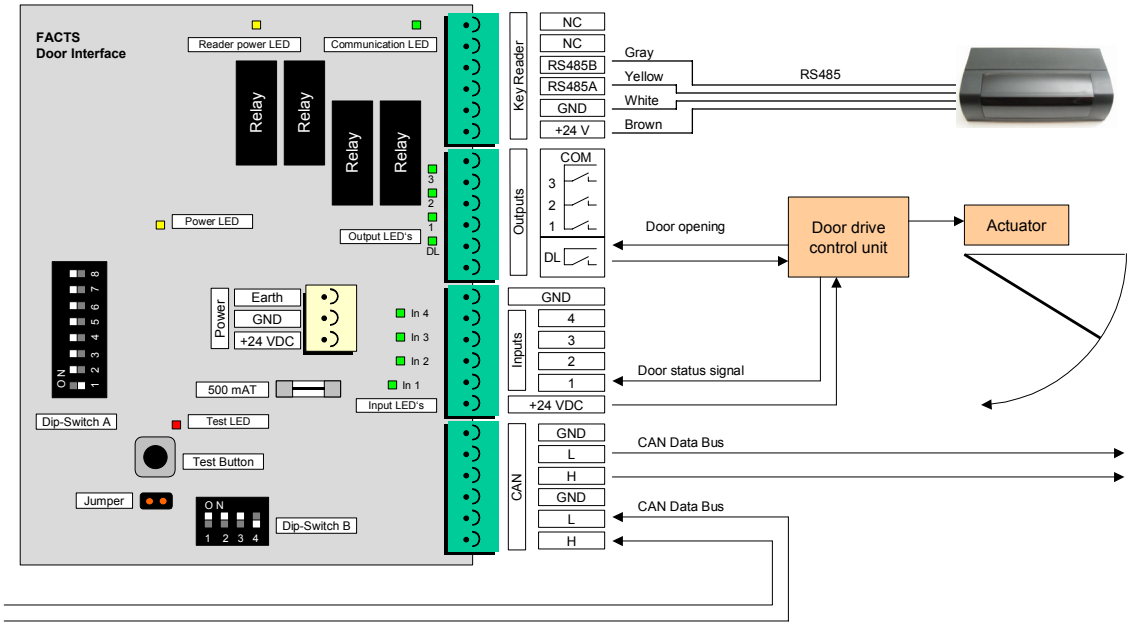

Figure 2: Reader and Door Interface connection

Power	Power supply and earth connection; protected by 500 mAT fuse Yellow power LED
CAN	In and out connection of CAN bus. Only two wires (H and L) need to be connected.
Inputs	Analogue status input signals. Input 1 used for the door opening status (opened or closed). Input 2 to 4 are not used. Green LED's showing the input signal status
Outputs	DL: Door opening signal 1..3/Com: Additional relay outputs with comon port Green LED's showing the relay output status

Key-reader	Power and data connection to the reader +24V: brown 0V: white RS 485A: yellow RS 485B: gray
Test Button	Button to initiate a communication test
Dip-Switch A	CAN address selection (see table below)
Dip-Switch B	• CAN address offset (+256) • Baud rate setting (see table below) • Termination switch
Jumper	No function, not used

2.3. LED-Functions

The status LEDs are operated as follows:

LED Group	LED Name	Color	Purpose
General Purpose In	IN 1	green	on, when input voltage at 'high' level off, when input voltage below 'high' level
	IN 2	green	see above
	IN 3	green	see above
	IN 4	green	see above
Door Lock Out	DL	green	on, when contact is closed (relay energized)
Output	OUT 1	green	on, when contact is closed (relay energized)
	OUT 2	green	on, when contact is closed (relay energized)
	OUT 3	green	on, when contact is closed (relay energized)
Key-Reader	TAG PWR	yellow	on, when power is applied to the key reader blinking, if no communication to key reader
	COM	green	always on
Power	PWR	yellow	on, when power is good for operation
Test	TEST	Red	different status indications (see table below)

Test status indications:

Mode	Test LED	Description
Power-up	off	Application running, all ok
	blinking	Application not running
Normal operation	off	-
Test button pressed once	off	no communication to FACTS server
	blinking	communication to FACTS server ok
Test button pressed again	off	-

2.4. CAN Network

All FACTS Door Interfaces and General Purpose Interfaces can be connected together over a CAN data bus. For that, a simple two-wire cable will be used. Each Interface has a connector with two connection pairs for in and out direction of the CAN cable.

2.4.1. CAN address configuration

Every interface device on a CAN bus is identified by a unique address number. This number must be set by the dipswitches before installation and connection to the CAN bus.

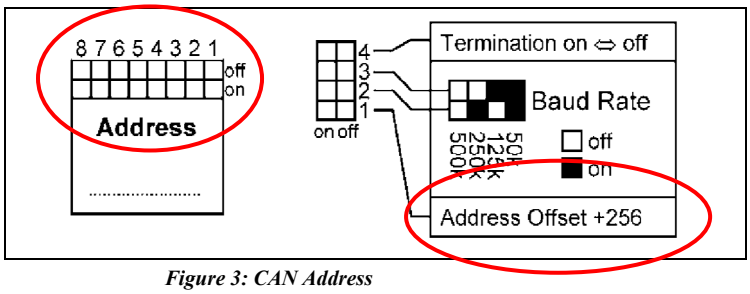

Figure 3: CAN Address

The address is defined with the dip-switch A and the offset switch on dip-switch B. The final address is calculated by the addition of the dezimal count of all switches set to ON.

	Dip-Switch A								Dip-Switch B
Switch	1	2	3	4	5	6	7	8	1
Dezimal count	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**
Address									
1	■	□	□	□	□	□	□	□	□
2	□	■	□	□	□	□	□	□	□
3	■	■	□	□	□	□	□	□	□
4	□	□	■	□	□	□	□	□	□
…									
255	■	■	■	■	■	■	■	■	□
256	□	□	□	□	□	□	□	□	■
257	■	□	□	□	□	□	□	□	■
…									
512	■	■	■	■	■	■	■	■	■

Default configuration:

- Address 0
- Termination off
- Baud Rate 500k

2.4.2. CAN-Bus data speed (Baud rate)

All interface devices on the same CAN bus must have the same data protocol speed. The maximum speed depends on the CAN network total length (see 2.4.4).

The FACTS Interfaces can be adjusted to 50, 125, 250 and 500 kbit/s by dip-switches:

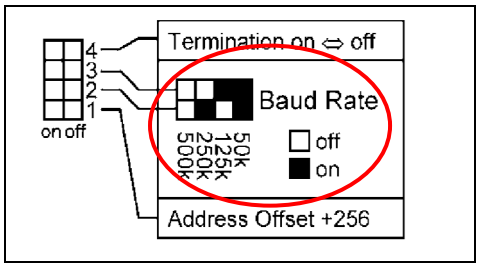

Figure 4: CAN Baud Rate

2.4.3. CAN-Bus termination

Every interface, which is connected at the end of a CAN bus must be terminated by a termination resistor. This resistor is already included on the interface boards and must only be activated by the corresponding dip-switch.

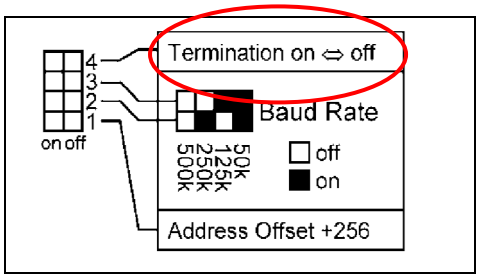

Figure 5: CAN Termination switch

2.4.4. CAN cable

For the CAN bus, a simple two wire cable can be used. But also existing LAN cables (CAT5 or CAT6) can be used.

Since the maximal bus length is a function of the baud rate, the design of the bus topology as well as the wiring has to be done very carefully. The following table shows the dependence of the bus length as a function of the baud rate:

Data bus speed	Cable type	Max. Bus length
50 kbit / s	0.75 ... 0.8 mm^2 AWG18	1200 m
125 kbit / s	0.5 ... 0.6 mm^2 AWG20	480 m
250 kbit / s	0.34 ... 0.6 mm^2 AWG22, AWG20	240 m
500 kbit / s	0.34 ... 0.6 mm^2 AWG22, AWG20	120 m

If one bus is used in an installation, the wires with the colors white/blue and blue are used. All other wires are not connected. If two buses are used, the first bus will get the wires white and blue, and the second bus the white/orange and orange. Please note that the white wires have to be the twisted each with the corresponding second color. Otherwise, proper communication is not possible.

If using an Ethernet twisted pair cable (Cat. 5 or 6, 4 by 2), only two wires out of eight are used. Hence, it is recommended to use the individual wires as follows:

Bus No.	CAN H	CAN L
1	white-blue	blue
2	white-orange	orange
3	white-green	green
4	white-brown	brown

2.4.5. CAN connector

Each interface has a CAN connector for two pairs of CAN wires for easy installation. The coming and continuing cables can each be connected to the connector with screws.

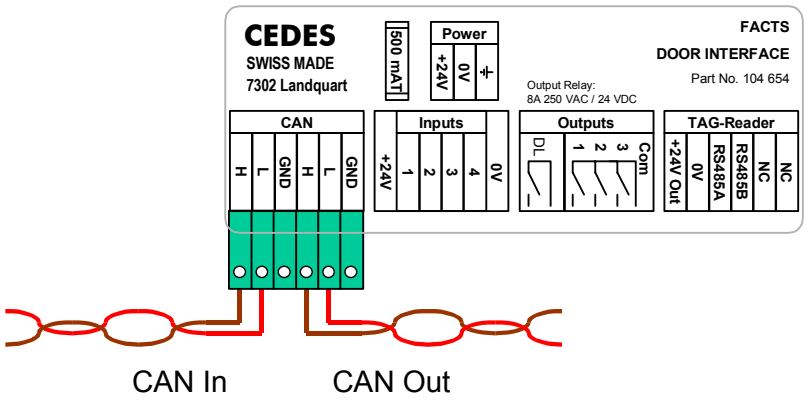

Figure 6: CAN connection

During normal operation, the coming and continuing cable pairs are connected through the Interface board.

Attention:

If the CAN connector is not connected to the Interface, the CAN bus is interrupted. Therefore, the two wire pairs must be put together.

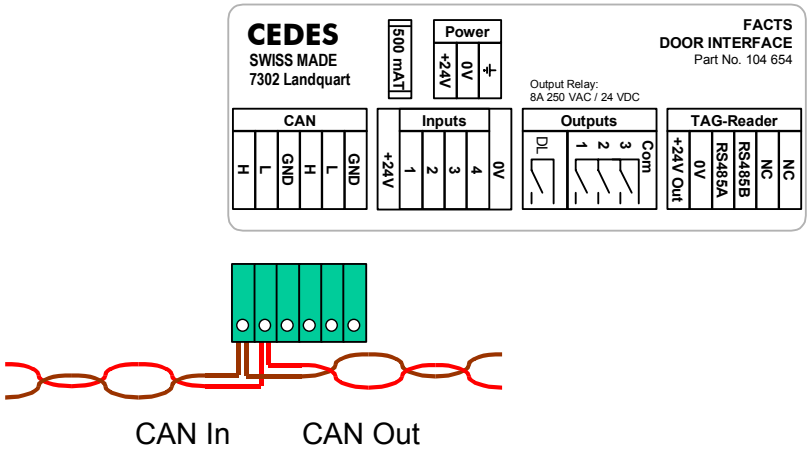

Figure 7: CAN connection

3. Technical Specifications

3.1. General Data

Number of keys programmable in memory	max. 2000
Number of readers connected	max. 1
Data connection	CAN bus Proprietary CAN protocol
CAN Bit rate	50 … 500 kbit/s
Operation mode	off-line and on-line
Connection mode	stand-alone and networked
Output	1 door lock relay 3 additional relays with common port
Intput	4 digital inputs
Protection class	IP54
Temperature range	operation: -20 ... +60°C storage/transport: -25 ... +70°C
Relative humidity	5 … 90% non-condensing
Dimensions	200 x 128 x 45 mm (length x width x height)
Housing material	ABS
Vibration and shock resistance	- IEC 68-2-29 Shock - IEC 68-2-6 Resonance shaking - Mil STD 810E Random
EMC / EMI	- EN 61000-6-2d 2002-08 (Immission) - EN 61000-6-3d 2002-08 (Emission)

3.2. Electrical Data

Power supply voltage	24 VDC ±10% inverse polarity protected Connector 3 pin, WAGO
Power supply fuse protection	SI 500 mAT 250V 5x20 mm
Current consumption (including Key-Reader connected)	max. 500 mA
Power consumption	15W
Connection to protective ground	yes the device has to be connected with low impedance to protective ground (earth) in order to fulfill EMC standards
Key-Reader connection	
Connector	J Male connector 6 pin, 3.81mm
Supply output to Key-Reader	max. 300 mA
Power supply Key-Reader fuse	SI 500 mAT 250V 5x20 mm
Data communication	RS485 (max. 30 m cable length)
Relay outputs	
Connector	J Male connector 6 pin, 3.81mm
Relay contact rating	max. 2 A / 30 VAC/DC
Relay operations	Mechanical: 20 x 10^6 operations minimum Electrical (resistive load): 50 x 10^3 operations minimum

Inputs	
Connector	J Male connector 6 pin, 3.81mm
Input voltage for logical 'low'	max. 3 VDC
Input voltage for logical 'high'	min. 10 VDC
Signal voltage on input connector	+24 VDC max. 40mA not to be used as power supply to drive other devices
CAN Bus	
Connector	J Male connector 6 pin, 3.81mm
Can-Bus Cable type	Impedance: 120 Ohms Mutual capacitance: nom. 40nF/km Twisted pair *Length [m]* *Type* 1000 AWG18 480 AWG20 240 AWG22 or AWG20 120 AWG24, AWG22 or AWG20
CAN-Bus data speed	*Length [m]* *Speed [kbit/s]* 1000 50 480 125 240 250 120 500

3.3. Mechanical data

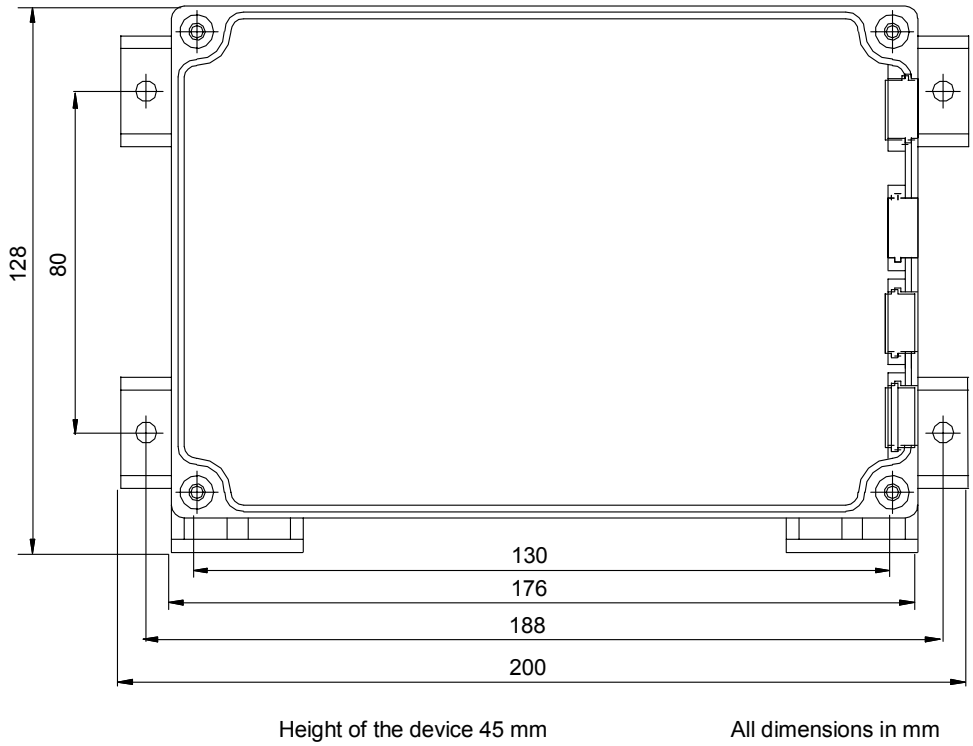

Fig. 8: Housing of the Door Interface