APS 400

NWGD 46LIFT

Dual Wiegand network interface for elevator control (up to 4 floors)

User's guide

techfass®

1 Content

2 Product description

The *NWGD 46LIFT* [1] dual Wiegand network interfaces are designed for connection of one or two readers, biometric sensors and similar devices with *WIEGAND output* (26, 34, 42 or 56 bits) to the *APS BUS* of the APS 400 identification system. Up to 16 NWGD 46LIFT network interfaces can be connected to a single MCA 168 controller.

The modules are designed for elevator control (up to 4 floors).

The dual network interfaces are delivered inside a cover for DIN rail mounting.

Pic. 1: NWGD 46LIFT

The *NWGD 46LIFT* is intended for connection of one or two standard readers with Wiegand interface independent of the identification technology and/or for control of the *APERIO* wireless locks. So, various reader technologies (HID proxy, iCLASS, Mifare, Mifare DesFire, Indala etc.) according to the needs of customers can be used in APS 400 identification system.

The module is designed for connecting readers without keypad or with reason keypad (entering a functional code) for time and attendance purposes, or for PIN pad readers.

The PIN code has 4 digit fixed length in APS 400 systems.

> When a key press evaluation is required the keypad data transmission has to be configured as follows: One key buffering, message length 4 bits, no parity.

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[1] Commercial designation of available versions is described in *table 1*.

3 Technical parameters

3.1 Product version

<table>
<tr><th rowspan="2">Version</th><th>Product designation</th><th>Catalogue number</th><th>Attachable devices</th></tr>
<tr><td>NWGD 46LIFT</td><td>54446C01</td><td>2x reader with a standard WIEGAND output</td></tr>
</table>

Table 1: Product version

3.2 NWGD 46LIFT technical features

<table>
<tr><th rowspan="11">Technical features</th><td>Supply voltage</td><td></td><td>8 ÷ 28 VDC</td></tr>
<tr><td rowspan="2">Current demand</td><td>Typical</td><td>70 mA</td></tr>
<tr><td>Maximal</td><td>150 mA</td></tr>
<tr><td>Memory</td><td>Cards</td><td>4x 750 IDs (for emergency function)</td></tr>
<tr><td>Inputs</td><td></td><td>4x logical potential-free contacts</td></tr>
<tr><td>Outputs</td><td></td><td>4x relay NC/NO, 2A/24V</td></tr>
<tr><td>Indicators</td><td></td><td>LED indicators for communication and input/output status signaling on the PCB</td></tr>
<tr><td>Tamper protection</td><td></td><td>Terminals for external NC contact</td></tr>
<tr><td>Reader interface</td><td></td><td>2x Wiegand, 2x PIEZO, 2x power supply terminals, 2x TAMPER</td></tr>
<tr><td>Communication interface</td><td></td><td>1x RS 485 – APS BUS</td></tr>
</table>

Table 2: Technical features of NWGD 46LIFT

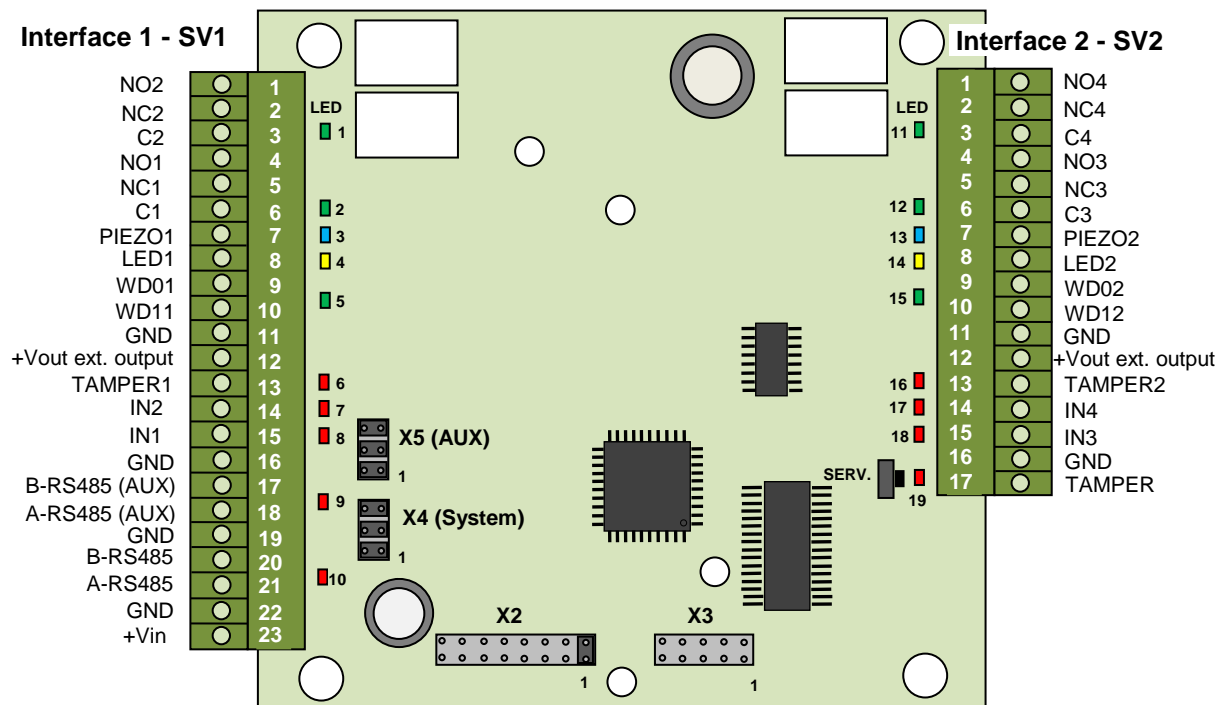## 3.3 Mechanical design

<table>
<tr><th rowspan="5">Design</th><td>Weight</td><td>0,218 kg</td></tr>
<tr><td>Operating temperature</td><td>-10°C ÷ +40°C</td></tr>
<tr><td>Humidity</td><td>Max. 75%, non-condensing</td></tr>
<tr><td>Environment</td><td>Indoor</td></tr>
<tr><td>Dimensions</td><td>6 DIN units, low profile</td></tr>
</table>

Table 3: Mechanical design

4 Installation

4.1 Terminals and jumpers

Pic. 2 Terminals and jumpers

Configurat. X2		
	X2.1 ÷ 6	HW address (A0 ÷ A5)
	X2.7 ÷ 8	Reserved

Table 4: Configuration jumpers X2

X3		
	X3.1 ÷ 5	Factory use

Table 5: Factory use connector X3

RS 485 X4, X5		
	X4(5).1	Idle state definition (B)
	X4(5).2	Idle state definition (A)
	X4(5).3	Line terminator

Table 6: Setting the RS 485 lines X4, X5

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Terminal block SV1			
1	Ad 2 - Relay NO	LED 1	
2	Ad 2 - Relay NC		
3	Ad 2 - Relay C		
4	Ad 1 - Relay NO	LED 2	
5	Ad 1 - Relay NC		
6	Ad 1 - Relay C		
7	Ad 1 - Beeper (reader)	LED 3	
8	LED indication (reader)	LED 4	
9	Ad 1 - Wiegand DATA 1	LED 5	
10	Ad 1 - Wiegand DATA 0		
11	0 V output		
12	+8 ÷ 28 VDC external output		
13	Tamper ext. 1	LED 6	
14	Ad 2 - Input 1	LED 7	
15	Ad 1 - Input 1	LED 8	
16	0 V		
17	B wire – AUX RS 485 BUS	LED 9	
18	A wire – – AUX RS 485 BUS		
19	0 V		
20	B wire RS 485	LED 10	
21	A wire RS 485		
22	0 V power supply		
23	+8 ÷ 28 VDC power supply		

Tab. 7: Terminal block SV1 and LEDs

Terminal block SV2			
1	Ad 4 - Relay NO	LED 11	
2	Ad 4 - Relay NC		
3	Ad 4 - Relay C		
4	Ad 3 - Relay NO	LED 12	
5	Ad 3 - Relay NC		
6	Ad 3 - Relay C		
7	Ad 3 - Beeper (reader)	LED 13	
8	Alarm LED	LED 14	
9	Ad 2 - Wiegand DATA 1	LED 15	
10	Ad 2 - Wiegand DATA 0		
11	0 V output		
12	+8 ÷ 28 VDC external output		
13	Tamper ext. 2	LED 16	
14	Ad 4 - Input 1	LED 17	
15	Ad 3 - Input 1	LED 18	
16	0 V		
17	TAMPER		

Tab. 8: Terminal block SV2 and LEDs

Service		
	1 short click	Confirmation of config. change (X2)

Table 9: Service button

4.2 Standard connection (recommended, not obligatory) [2)]

Connection		
Address 1 ÷ 4	Input 1	Door contact / lift button contact, active when door closed / button pressed
	Output 1	Door lock control / floor selection button enabling or disabling

Table 10: Standard connection

[2)] The function of inputs and outputs is defined by user's programming of the controller.

4.3 LED Indicators

LED indicators			
Red LED 10 (9)		Continuously lit	Online operating mode via RS 485
		Blinking with 2s period	Offline mode, emergency function enabled
		Short flashing with 1 s period	Offline mode, emergency function disabled
Yellow LED 4 (14)			Reserved
Red LED 10			Communication on the system BUS
Red LED 9			Reserved
Green LED 5 (15)			ID media reading from external reader
Green LED 6,7,8 (16,17,18)			Activated inputs
Green LED 1,2 (11,12)			Switched on relays
Blue LED 3 (13)			Activated beepers

Table 11: LED indicators

4.4 Installation instructions

The door module is intended for DIN rail mounting into a switchboard or directly on the wall using the DIN rail enclosed.

5 Setting parameters of the module

Parameters	Parameter	Possible range	Default setting
	Enabling of emergency function	YES / NO	NO
	Address on a communication line	1 ÷ 64	1
	Keypad function	Reason / PIN / Code	Reason
	All parameters are given by programming through the MCA 168 control module, see http://www.techfass.cz/files/aps_400_config_en.pdf		

Table 12: Configurable parameters

5.1 Module parameters setting

Setting of all parameters of the reader module can be done only when the module is connected to the system bus of MCA 168 controller. Detailed instructions for setting reader module parameters are described in the *APS 400 Network Reader* configuration program user's guide available at: http://www.techfass.cz/files/m_aps_400_network_reader_en.pdf.

5.2 HW address setting

HW address setting is defined by the configuration of address jumpers X2.1 ÷ 5, see *Tab. 13*.

When configuring the address jumpers it is necessary to keep in mind that the module occupies four successive addresses on system bus and X2 jumpers define the lower one. E.g., it is not possible to set the following module address to the value of the previous one + 1 - 3; the address conflict appears on system bus in this case.

Address jumpers X2

Address	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
X2.1	●	○	●	○	●	○	●	○	●	○	●	○	●	○	●	○
X2.2	○	●	●	○	○	●	●	○	○	●	●	○	○	●	●	○
X2.3	○	○	○	●	●	●	●	○	○	○	○	●	●	●	●	○
X2.4	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●	○
X2.5	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	●
X2.6	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Address	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
X2.1	●	○	●	○	●	○	●	○	●	○	●	○	●	○	●	○
X2.2	○	●	●	○	○	●	●	○	○	●	●	○	○	●	●	○
X2.3	○	○	○	●	●	●	●	○	○	○	○	●	●	●	●	○
X2.4	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●	○
X2.5	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○
X2.6	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	●
Address	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
X2.1	●	○	●	○	●	○	●	○	●	○	●	○	●	○	●	○
X2.2	○	●	●	○	○	●	●	○	○	●	●	○	○	●	●	○
X2.3	○	○	○	●	●	●	●	○	○	○	○	●	●	●	●	○
X2.4	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●	○
X2.5	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	●
X2.6	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Address	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
X2.1	●	○	●	○	●	○	●	○	●	○	●	○	●	○	●	○
X2.2	○	●	●	○	○	●	●	○	○	●	●	○	○	●	●	○
X2.3	○	○	○	●	●	●	●	○	○	○	○	●	●	●	●	○
X2.4	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●	○
X2.5	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○
X2.6	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○

Table 13: Address jumpers X2

Legend: ●   … set (ON)   ○   … removed (OFF)
Confirmation of any address setting by clicking the service button on the PCB is required. If not the address change will be taken into account after the nearest disconnecting and connecting of the module supply voltage.

5.3 Configuration of the reader keypad

The door controller can accommodate either reader without keypad or keypad readers. When a key press evaluation is required by the door controller, the keypad data transmission has to be configured as follows:

- One key buffering.
- Message length 4 bits.
- No parity.

5.4 WIEGAND input data interpretation

5.4.1 Standard configuration

The module accepts the *WIEGAND* formats mentioned in the *table 14*. If the read signal is formatted otherwise, the data are not considered as valid and thus ignored. If another format of data is required to be considered as valid, it is necessary to set up the *User configuration* of the data read at the WIEGAND input. The table also shows the process used for individual width of read data.

	Read data width	Process	Resulting code width
Accepted formats	26 bits	Parity bits cut off (in front and at the back)	24 bits
	32 bits	Data bytes reversed	32 bits
	34 bits	Parity bits cut off (in front and at the back)	32 bits
	37 bits	Parity bits cut off (in front and at the back)	35 bits
	42 bits	Parity bits cut off (in front and at the back)	40 bits
	44 bits	Last 4 bits cut off	40 bits
	56 bits	Data bytes reversed	56 bits

Table 14: Accepted formats of read WIEGAND data– standard configuration

5.4.2 User configuration

The module offers an option to use the *user configuration of WIEGAND input interpretation*. By default the user configuration is not used. To enable user configuration, see the user's guide to the *APS 400 Network Reader* program, which is available at http://www.techfass.cz/files/m_aps_miniplus_reader_en.pdf.

Note: User configuration *WIEGAND input* requires a deeper knowledge of the issue; we recommend leaving the setting to an installation company.

6 Interface module functioning

6.1 Operating modes

The NWGD 46LIFT dual Wiegand interfaces are intended for online operating mode on APS 400 system BUS (*APS BUS*). The activity of the modules is defined by the system controller; so the modules are able to provide various functions not only controlling of the door.

In case of the communication line fails the modules can work in offline mode (when the *emergency function* is enabled) - it concerns the exit readers mostly. The "Door Open" function for last 748 valid cards registered before can be performed in this mode only.

6.2 Emergency "Door Open" function description

When the "Door Open" function is activated, the door lock is released and the beeper activated until the door is open or 5 s door lock release time has elapsed.

All events triggered while the offline mode is in progress are saved neither in the controller nor in the module memory.

7 Useful links

- Wiring diagrams: http://techfass.cz/diagrams-aps-400-en.html
- Program equipment: http://techfass.cz/software-and-documentation-en.html