

# **NREM 65**

*Network reader module*

*User's guide*



**techfass®**

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## 2 Product description

The **NREM 65** <sup>1)</sup> reader modules are designed for connection to the **APS BUS** of the APS 400 identification system. Up to 64 reader modules NREM 65 can be connected to a single MCA 168 controller.

The reader module is designed for surface mounting in outdoor and indoor environment.

### 2.1 NREM 65 BK reader module

The NREM 65 BK modules are delivered in installation boxes in matt black color (*pic. 1*).



*Pic. 1: NREM 65 BK reader module*

### 2.2 NREM 65 GR reader module

The NREM 65 GR modules are delivered in installation boxes in dark grey color (*pic. 2*).



*Pic. 2: NREM 65 GR reader module*

<sup>1)</sup> Commercial designation of available versions is described in *table 1*.

## 3 Technical parameters

### 3.1 Product version

Product version	Product designation	Color	Catalogue number	Module features <sup>2)</sup>	
				TF	EM
	NREM 65 BK – TF	<i>Matt black</i>	54465000	✓	✗
	NREM 65 BK – EM	<i>Matt black</i>	54465001	✓	✓
	NREM 65 GR – TF	<i>Dark grey</i>	54465200	✓	✗
	NREM 65 GR – EM	<i>Dark grey</i>	54465201	✓	✓

*Table 1: Product version*

<sup>2)</sup> **TF** – TECHFASS factory ID media reading; **EM** – EM Marin ID media reading;

## 3.2 Technical features

Technical features	Supply voltage		8 ÷ 15 VDC (SELV)
	Current demand	Typical	80 mA
		Maximal	90 mA
	Keypad version		N/A
	ID technology, typical reading range	EM Marin	8 cm (with ISO card)
	Card memory		750 (for emergency function)
	Inputs		2x Logical potential-free contact
	Outputs		OC switching on 0 V, 2A/24V
			Transistor output 5V/5mA + yellow LED
	I/O Port	External device	Ext. tamper / ext. reader buzzer control / Reading synchronization: MASTER / SLAVE mode
	Indicators		3x LED 1x PIEZO
	Tamper protection	Against tearing-off	Hall probe
		Opening the cover	Opto-electronic
	Communication interface		RS 485 - APS BUS
	Alternative data input / output		WIEGAND (configurable)

Table 2: Technical features

## 3.3 Special accessories

Accessories	MAG	51900200	Magnet for Hall probe
	WIO 22	51901200	Remote control module, 2x relay



Table 3: Special accessories

## 3.4 Using WIO 22 module for remote output control

The **WIO 22** remote control **WIEGAND** relay module is designated for secure output control of APS system reader modules. The door open or other functions can be controlled from the module located inside the secure area, while the reader module can be located in the non-secure area.

The module is controlled by **WIEGAND** signal directly from the reader module working in standard operating mode. The module must be paired with appropriate reader module before use.

### 3.5 Mechanical design

Mechanical design	Weight		0.202 kg
	Operating Temperature		-25 ÷ 60 °C
	Humidity		Max 95%, non-condensing
	Housing		IP 54, IK 07
	Pigtail		2 m
	Color	NREM 65 BK	Matt black
		NREM 65 GR	Dark grey
	Dimensions		55x90x25 mm

Table 4: Mechanical design

## 4 Installation

### 4.1 Wiring description

Wiring description	Color	Function	Color	Function
	Red	Power sup. +13 VDC	Green white	WIEGAND data 0
	Red blue	Power sup. +13 VDC	Brown green	WIEGAND data 1
	Green	I/O Port 3	Yellow	Input 1 (IN1)
	Blue	GND (0 V)	Grey	Input 2 (IN2)
	Black	A wire - RS 485 line	Violet	Output 1 (transistor)
	White	B wire - RS 485 line	Brown	0 V
	Pink	Output 2 (AUX)	Grey pink	0 V

Table 5: Wiring description

Wires belonging to the cables that are not used must be insulated!

### 4.2 Standard connection (recommended, not obligatory) <sup>3)</sup>

Connection	Input 1	Door contact, active when door closed
	Input 2	Request to exit button or handle contact, active when button or handle pressed
	Output 1	Door lock control (transistor switching on 0V)
	Output 2	AUX functions (transistor output +5 V/5mA) + yellow LED
	I/O Port	External tamper (Standard operating mode) External reader buzzer control (op. mode with entry reader) Reading synchronization: MASTER / SLAVE mode

Table 6: Standard connection

## 4.3 LED Indicators

D1 – top LED; D2 – middle LED; D3 – bottom LED

LED indicators	D1	Red	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
		Red / green	Fast switching	Address setting mode
		Green	Single flash	ID media reading
	D2	Yellow	Controlled by the controller's program <sup>3)</sup> , copies 2nd output status (AuxOutput)	
	D3	Green	Controlled by the controller's program <sup>3)</sup> , copies 1st output status (Relay1)	

Table 7: LED indicators

<sup>3)</sup> The function of inputs and outputs is defined by user's programming of the controller.

## 4.4 Installation instructions

The reader module uses passive RF/ID technology, which is sensitive to RF noise sources. Noise sources are generally of two types: radiating or conducting.

Conducted noise enters the reader via wires from the power supply or the host. Sometimes, switching power supplies generate enough noise to cause reader malfunction, it is recommended to use linear system power supplies.

Radiated noise is transmitted through the air. It can be caused by computer monitors or other electrical equipment generating electromagnetic fields.

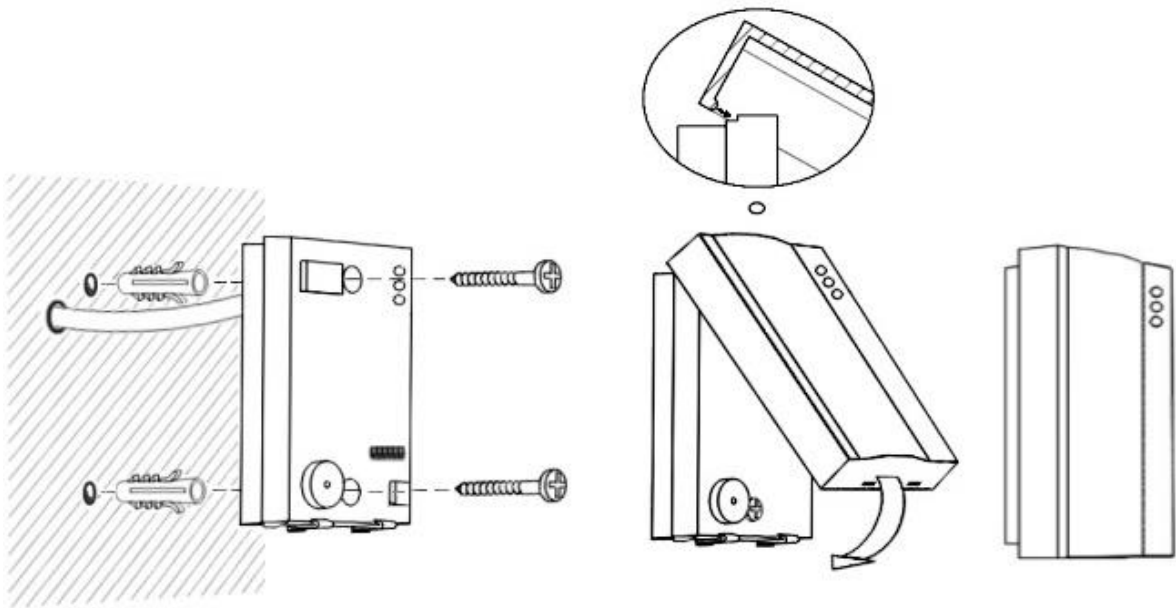
Consequently, a short distance between the reader modules themselves can cause reading malfunctions – for correct operation it is necessary to keep a minimum distance of 50 cm. Various metallic constructions may have a negative influence on this distance; if there are any doubts, it is recommended to make a practical test before final mounting.

Nearby metal surfaces may cause a decrease in reading distance and speed. This is caused by the combined effects of parasitic capacitance and conductance.

## 4.5 Mounting and removal the module

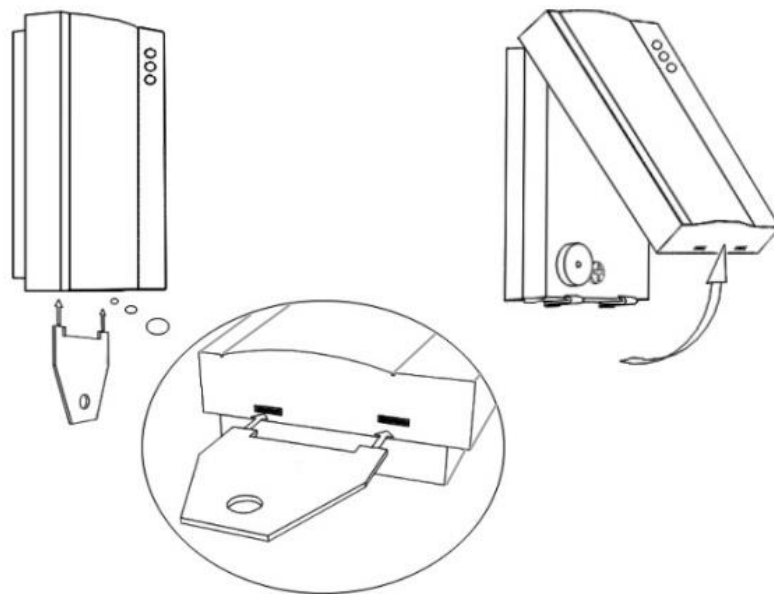
First fasten the base directly to the wall using two relevant fasteners, see *Pic. 3*. Then set the housing on the upper part of the base and rotate the housing until both parts snaps down.

It is recommended to place an installation box for connection of incoming cables on the other side of the wall or in highly secured area (with in/out readers).



*Pic. 3: Mounting of the reader module*

Release the clamps using the enclosed key before dismantling the housing, see *Pic. 4*.



*Pic. 4: Removal of the reader module*

## 5 Setting parameters of the reader module

### 5.1 Configurable parameters

Parameters	Parameter	Possible range	Default setting
	Enabling of emergency function	YES / NO	NO
	Address on a communication line	1 ÷ 64	1
	Internal reader configuration	Configurable	Standard
	Invert transistor output	YES / NO	NO
	Operating mode	Standard / Wiegand Input / Wiegand Output	Standard
All parameters are given by programming through the MCA 168 control module, see <a href="http://www.techfass.cz/files/aps_400_config_en.pdf">http://www.techfass.cz/files/aps_400_config_en.pdf</a>			

Table 8: Configurable parameters

### 5.2 Reader 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](http://www.techfass.cz/files/m_aps_400_network_reader_en.pdf).

## 6 Reader module functioning

### 6.1 Operating modes

The *NREM 65* reader modules 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 750 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 preset 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 reader memory.



### 6.3 Read ID media format

#### 6.3.1 EM Marin ID media format

The EM Marin ID media format can be changed into selected 24, 32 or 40 bits length of ID code. The default length is 40 bits. This setting is only changed when unifying of the ID media codes length is required – in combined systems with WIEGAND output readers with a fixed WIEGAND data format IDs (more information in *APS 400 Network Reader* user's guide available at [http://www.techfass.cz/files/m\\_aps\\_400\\_network\\_reader\\_en.pdf](http://www.techfass.cz/files/m_aps_400_network_reader_en.pdf)).

### 6.4 Wiegand interface configuration

#### 6.4.1 Standard operating mode

This is the module default operating mode. The Wiegand interface is used for controlling the WIO 22 module in this configuration. When the reader module operates in the standard operating mode, the I/O Port (*tab. 5*) is used as an input for monitoring an external device tamper status.

#### 6.4.2 Wiegand output

The module can be configured into a standard reader with a *WIEGAND output* in 26, 32, 42 or 44 bits format for *EM Marin* technology ID media. Read IDs are formatted with the previous setting first (see *chapter 6.3.1*), after that they are sent in the output format.

Wieg	ID media technology	Available configuration of the WIEGAND output format
	EM Marin	26bit, 32bit, 42bit, 44bit

*Table 9: ID media format in WIEGAND operating mode*

Two long beeps and the red LED lit feature powering up the module. The green LED blink indicates an ID reading.

Individual signals function in **WIEGAND output** operating mode is described in *table 10*.

Wiegand	Input 1	Beeper control (0 V active)
	Input 2	Yellow LED control (0 V active)
	Output 1 (transistor)	Tamper signaling; it follows the alarm state of tamper sensors (tamper signal = transistor switched on 0V) <sup>3)</sup>

Table 10: Signal function in WIEGAND operating mode

Since the **FW version 2.79** the reading synchronization of a **couple of TECHFASS readers** is implemented, enabling to **cancel the mutual disturbance** of the modules. The reader module offers the **Wiegand data interface synchronization** in **MASTER** mode.

### 6.4.3 Wiegand input (entry reader)

The module can be configured into a mode of controlling the door from both sides (**entry reader mode**).

In the **entry reader mode** an identification at an external reader connected via the **WIEGAND interface** acquires a **reason code 255**; at the same time the reader module operates standardly, the reason codes equal zero.

When the reader module operates in the entry reader operating mode, the I/O Port (*tab. 5*) is used as an output for controlling the entry reader buzzer.

Since the **FW version 2.79** the reading synchronization of a **couple of TECHFASS readers** is implemented, enabling to **cancel the mutual disturbance** of the modules. The reader module offers the **Wiegand data interface synchronization** in **SLAVE** mode.

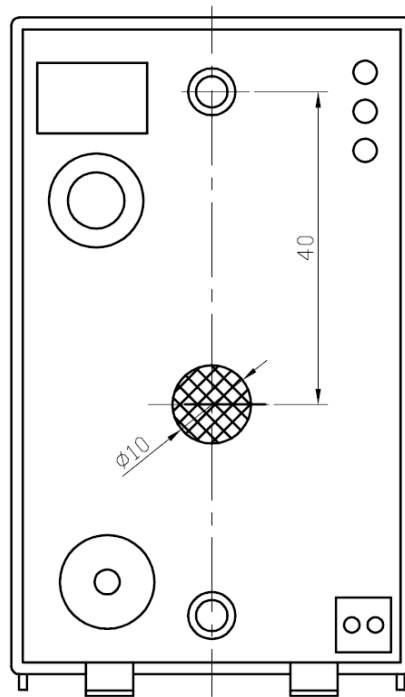
The **WIEGAND input** and **WIEGAND output** operating modes are mutually exclusive.

### 6.5 Reading synchronization

Since the **FW version 2.79** the reading synchronization of a **couple of TECHFASS readers** is implemented, enabling to **cancel the mutual disturbance** of the modules. The reader module offers to use the **IO synchronization** in both **MASTER** and **SLAVE** mode. The **input/output port 3** is used as the **synchronization signal**.

## 7 Placing a magnet for tearing-off indication

Drill a  $\varnothing$  10 mm hole 12 mm deep in a wall behind the reader module at designated place (*Pic. 5*). Insert a magnet (ordering number 51900200) and attach it in the hole with appropriate mastic to ensure the top surface of the magnet matches with the wall surface. Mount the reader module in formerly prepared holes mounted with plugs.



*Pic. 5: Magnet placement*

## 8 Useful links

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