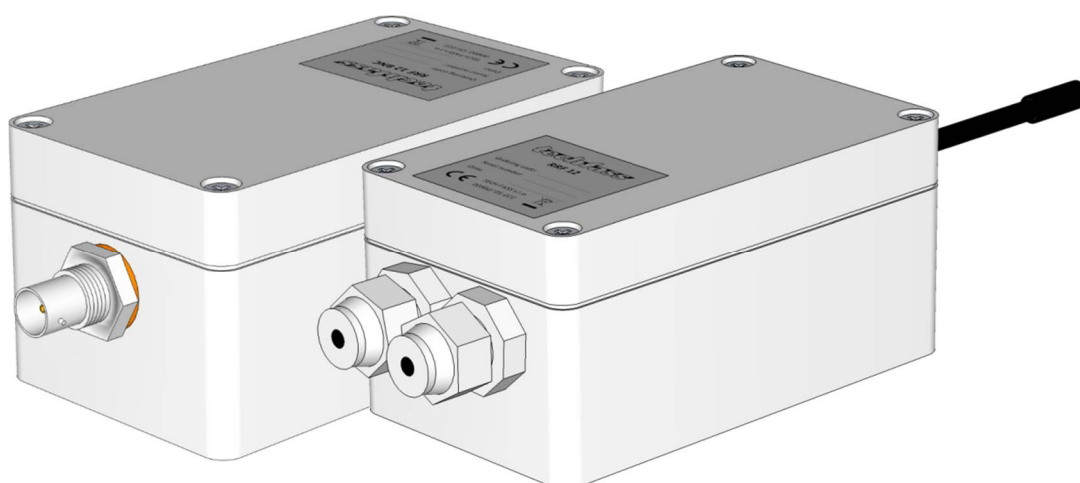


# **NRRF 12**

*Long range network reader modules 433 MHz*

*User's guide*



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## 2 Product description

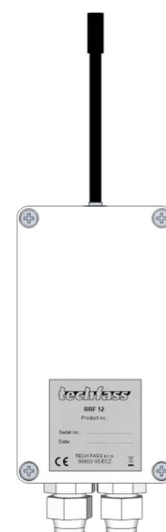
The **NRRF 12** <sup>1)</sup> long range reader modules operate on frequency 433,92 MHz. Active transmitters Tx Key, Tx Cross or Tx Auto are required for proper operation.

The modules are designed for connection to the APS BUS of the APS 400 identification system. Up to 64 reader modules NRRF 12 can be connected to a single MCA 168 controller.

The modules are intended for surface mounting in outdoor environment. They are suitable for vehicle door control and everywhere a long reading range is required, e.g. gates garages, bars etc.

### 2.1 NRRF 12

The NRRF 12 module (*pic. 1a*) is equipped with an integrated antenna supporting typical reading range about 10 m.



*Pic. 1a: NRRF 12*

### 2.2 NRRF 12 BNC

The NRRF 12 BNC module (*pic. 1b*) is equipped with a BNC connector for connecting a 433 MHz antenna. Offered antenna type can be found in the product accessories list.



*Pic. 1b: NRRF 12 BNC*

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

## 3 Technical parameters

### 3.1 Product version

Product version	Product designation	Catalogue number	Antenna	Identification media
	NRRF 12 – TF	54412000	Integrated	433 Mhz TF media
	NRRF 12 BNC– TF	54412800	External	433 Mhz TF media

Table 1: Product version

### 3.2 Technical features

Technical features	Supply voltage		8 ÷ 15 VDC
	Current demand	Typical	70 mA
		Maximal	130 mA
	Operating frequency		433.92 MHz
	Typical reading range	NRRF 12	10 m
		NRRF 12 BNC	Depends on used antenna type
	Memory of transmitters		750 ID, (for emergency function) <sup>1</sup>
	Version with keypad		Pressed button on the transmitter can be interpreted by the controller as a functional code
	Inputs		2x logical potential-free contact
	Outputs		2x relay NC/NO, 2A/24V
	Indicators		3x LED 1x terminals for external beeper
	Tamper protection		Integrated NC contact
	Communication interface		RS 485 – APS BUS
	Alternative data output		WIEGAND (configurable)

Table 2: Technical features

### 3.3 Mechanical design

Design	Weight	0,214 kg
	Operating temperature	-25°C ÷ +60°C
	Humidity	Max. 95%, non-condensing
	Housing	IP 65
	Dimensions	65x115x55 mm

Table 3: Mechanical design

### 3.4 Special accessories






Special accessories	GP 433	51901400	Omnidirectional external antenna for xRRF 12 BNC
			
	Tx Key	51590200	Miniature pocket transmitter 433 MHz with 2 buttons, rolling code
	Tx Key/50	51590201	Miniature pocket transmitter 433 MHz with 2 buttons, rolling code (50 pc.)
			
	Tx Cross	51590300	Miniature pocket transmitter 433 MHz with 4 buttons, rolling code
	Tx Cross/50	51590301	Miniature pocket transmitter 433 MHz with 4 buttons, rolling code (50 pc.)
			
	Tx Auto	51590400	Car transmitter 433 MHz for fixed assembly, rolling code
	Tx Auto/100	51590401	Car transmitter 433 MHz for fixed assembly, rolling code (100 pc.)
			
	WIO 22	51901200	Remote control module, 2x relay
			

Table 4: Special accessories

### 3.5 Transmitters description


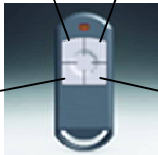
Transmitters description	Tx Key	Tx Cross	Tx Auto
	<p>Button 1      Button 2</p> 	<p>Button 2      Button 3</p> <p>Button 4      Button 1</p> 	<p>Button 1 – 1x click            Button 2 – 2x click            Button 3 – 3x click            Button 4 – 4x click</p> <p><i>Refer the Tx Auto manual please</i></p>

Table 5: Transmitters description

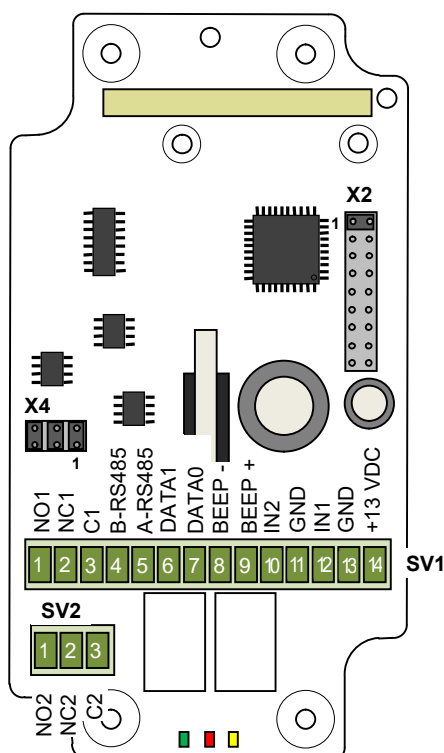
### 3.6 Using WIO 22 module for remote output control

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.

## 4 Installation

### 4.1 Terminals and jumpers



Pic. 2 Terminals and jumpers

Jumpers X2	X2.1 ÷ 6	HW address (A0 ÷ A5)
	X2.7	Reserved
	X2.8, 9	Reserved

Table 6: Address jumpers X2

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

Table 7: Setting the RS 485 line X4

Terminal block SV1	1	Relay1 NO
	2	Relay1 NC
	3	Relay1 C
	4	B - RS 485
	5	A - RS 485
	6	Wiegand DATA 1
	7	Wiegand DATA 0
	8	Beeper -
	9	Beeper +5 V
	10	Input 2
	11	0 V
	12	Input 1
	13	Supply voltage 0V
	14	Supply voltage +13,8 V

Table 8: Terminal block SV1

Relay2 SV2	1	Relay2 NO
	2	Relay2 NC
	3	Relay2 C

Table 9: Terminal block SV2

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

Std. 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 (relay1)
	Output 2	AUX functions (relay2) + yellow LED

Table 10: Standard connection

### 4.3 LED Indicators

LED indicators	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
	Green	ID media reading	
	Yellow	Controlled by the controller's program <sup>3)</sup> , copies 2nd output status (AuxOutput)	

Table 11: LED indicators

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

The indicating LEDs are situated directly on the PCB, so they can be seen when the cover is open only.

### 4.4 Installation instructions

Fasten the module directly on the wall in outdoor or indoor environment. Keep the module away from big metal parts to avoid decreasing of reading range.

## 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
	Operating mode	Standard/Wiegand OUT	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 12: 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).



## 5.3 HW address setting

HW address setting is defined by the configuration of address jumpers X2.1 ÷ 6, see *Tab. 6 and 13*.

Address jumpers X2	Address	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Table 13: Address jumpers X2 Legend: ● ... set (ON) ○ ... removed (OFF)
	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	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○	

Reader module's reset is required after any change of address setting, disconnect and connect the supply voltage again.

## 6 Reader module functioning

### 6.1 Operating modes

The **NRRF 12** 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

The ID media format can be changed into selected 24 or 32 bits length of ID code. The default length is 32 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 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 internal reader configuration first, after that they are sent in the output format.

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 14*.

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

*Table 14: Signal function in WIEGAND operating mode*