

**APS**400

***NREM 80 ThanGH***

***NREM 80 LithGH***

*APS 400 network reader modules for Thangram and Lithos entry panels*

*User's guide*



**techfass®**

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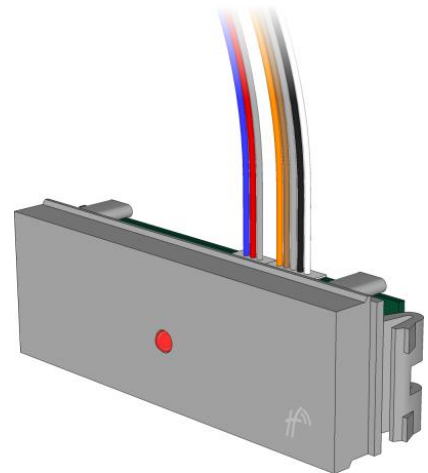
## 2 Product Description

The *NREM 80 ThanGH* and *NREM 80 LithGH* <sup>1)</sup> reader modules are designed for connection to the *APS BUS* of the *APS 400* identification system. Up to 64 *NREM 80* reader modules can be connected to a single MCA 168 controller.

The reader modules are designed for installation in *Thangram* / *Lithos* entry panels of *BPT* audio and video systems, where they occupy only one button space. The modules are customized for power supply and control from BPT entry systems.

### 2.1 NREM 80 ThanGH

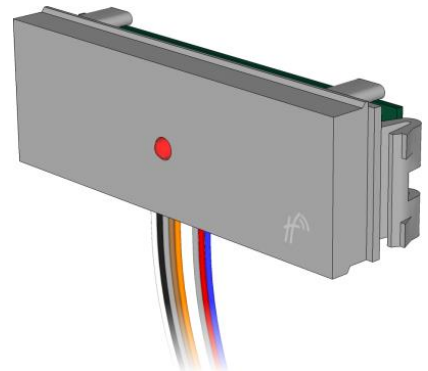
The modules are designed for installation in *Thangram* entry panels of *BPT* audio and video systems and come in *GH* (greyhound) color version of the buttons.



Pic. 1a: NREM 80 ThanGH

### 2.2 NREM 80 LithGH

The modules are designed for installation in *Lithos* entry panels of *BPT* audio and video systems and come in *GH* (greyhound) color version of the buttons.



Pic. 1b: NREM 80 LithGH

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

### 3 Technical parameters

#### 3.1 Product version

| Product version | Product designation | Module designed for panel | Catalogue number | Module features <sup>2)</sup> |    |
|-----------------|---------------------|---------------------------|------------------|-------------------------------|----|
|                 |                     |                           |                  | TF                            | EM |
|                 | NREM 80 ThanGH – TF | Thangram                  | 54480000         | ✓                             | ✗  |
|                 | NREM 80 ThanGH – EM | Thangram                  | 54480001         | ✓                             | ✓  |
|                 | NREM 80 LithGH – TF | Lithos                    | 54480400         | ✓                             | ✗  |
|                 | NREM 80 LithGH – EM | Lithos                    | 54480401         | ✓                             | ✓  |

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 ÷ 28 VDC                                |
|--------------------|--------------------------------------|----------|---|
|                    | Current demand                       | Typical  | 60 mA (12 V), 25mA (28 V)                 |
|                    |                                      | Maximal  | 90 mA (8 V)                               |
|                    | Version with keypad                  |          | N/A                                       |
|                    | ID technology, typical reading range | EM Marin | 5 cm (with ISO card)                      |
|                    | Memory                               |          | 750 ID (emergency function)               |
|                    | Inputs                               | Input 1  | 1x logical potential-free contact         |
|                    |                                      | Input 2  | 1x logical potential-free contact         |
|                    | Output <sup>3)</sup>                 |          | 1x open collector 0V active, max. 2A, 24V |
|                    | Signalization                        |          | 1x LED<br>1x PIEZO                        |
|                    | Tamper protection                    |          | N / A                                     |
|                    | Communication interface              |          | RS 485 – APS BUS                          |
|                    | Alternative data input / output      |          | N / A                                     |

Table 2: Technical features

<sup>3)</sup> The DC type of door lock has to be used only! Suitable anti-parallel diode has to be connected to its coil as over-voltage protection.

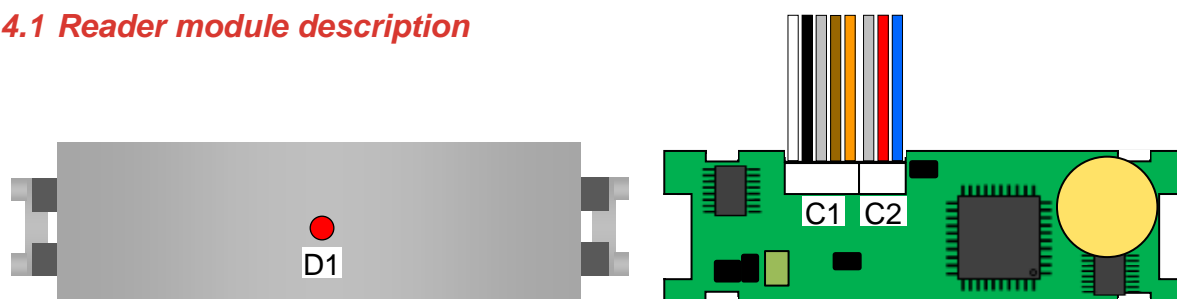
### 3.3 Mechanical design

|                   |                                     |   |
|-------------------|-------------------------------------|---|
| Mechanical design | Weight                              | 0.017 kg                                |
|                   | Operating Temperature               | -25 ÷ 60 °C                             |
|                   | Humidity                            | Max. 95%, non-condensing                |
|                   | Housing                             | IP 54, IK 04 (built in the entry panel) |
|                   | Pigtail                             | 2x 0.4 m                                |
|                   | Color                               | Greyhound                               |
|                   | Dimensions (Height x Width x Depth) | 17x53x13 mm                             |

Table 3: Mechanical design

## 4 Installation

### 4.1 Reader module description



Pic. 2: NREM 80 reader module, front (left) and rear (right) view

|             |             |   |
|-------------|-------------|---|
| Description | Designation | Purpose                                     |
|             | C1          | Connector for C1 cable (5-wires) connection |
|             | C2          | Connector for C2 cable (3-wires) connection |
|             | D1          | Red-green LED indicator                     |

Table 4: Connectors and LED indicators description

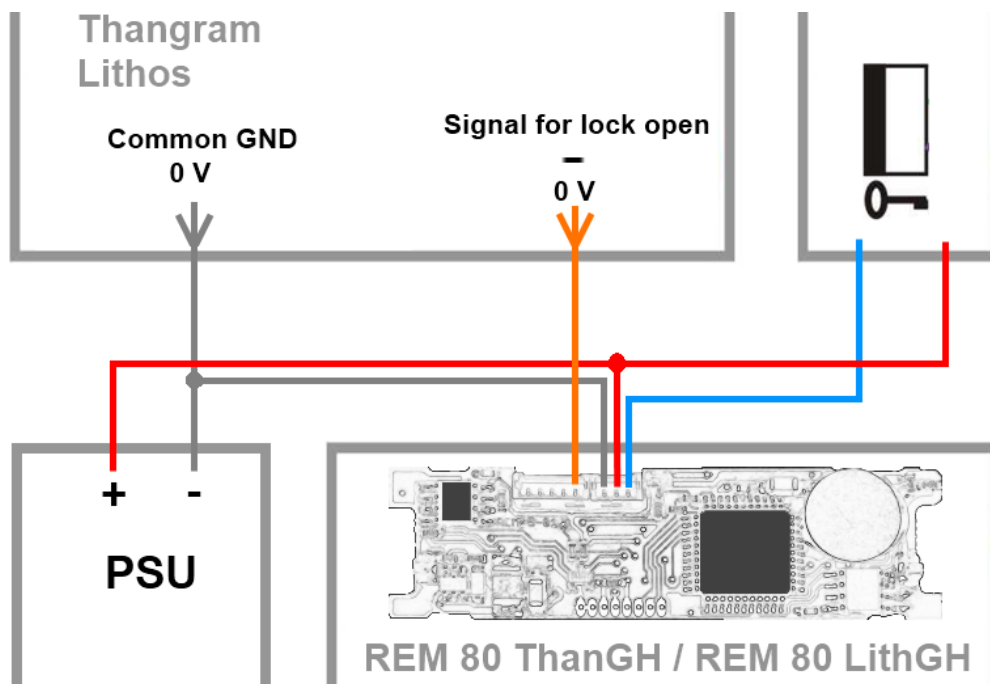
### 4.2 C1 and C2 cable wiring description

|                    |          |                     |          |                          |
|--------------------|----------|---------------------|----------|--------------------------|
| Wiring description | C1 cable |                     | C2 cable |                          |
|                    | Color    | Function            | Color    | Function                 |
|                    | White    | B wire - RS485 line | Grey     | 0 V (GND)                |
|                    | Black    | A wire - RS485 line | Red      | Power supply +8 ÷ +28VDC |
|                    | Grey     | 0 V (GND)           | Blue     | Output 1 - OC            |
|                    | Brown    | Input 1 (IN1)       |          |                          |
|                    | Orange   | Input 2 (IN2)       |          |                          |

Table 5: C1 and C2 cable wiring description

All unused wires must be mutually isolated!

### 4.3 Reader module standard connection



Pic. 3: Standard reader module connection with use of DC power supply and the lock opening contact of the Thangram / Lithos entry panel


| Standard connection | Signal                                | Connection   |
|---------------------|---------------------------------------|--|
|                     | + 8 ÷ + 28 VDC                        | + contact (power supplier unit), red wire of C2 cable (reader module), + contact (door lock)   |
|                     | 0 V (GND)                             | - contact (power supplier unit), grey wire of C2 cable (reader module), - contact for power supply of the entry panel  |
|                     | Release lock from panel, 0 VDC active | Signal for door lock opening – (minus contact next to the  at the entry panel), orange wire of C1 cable (reader module) |
|                     | Release lock from reader              | Blue wire of C2 cable (reader module), - contact (door lock)   |

Table 6: Standard reader module connection using the entry panel door lock release signal

This connection expects using the **second input** of the reader module as a “**request to exit button**”. The function has to be ensured by handling the proper event in the **controlling program** of the system controller. The door lock is controlled by the first output of the reader module (open collector switching to 0 V) – blue wire of C2 cable.

The reader module is powered by a **DC** power supplier. When using suitable power supplier and door lock type, you can power all components (entry panel, reader module and door lock) from a single power supplier. If an **AC** powered door lock must be used, it is necessary to use an individual **external relay** controlled by the OC signal from the reader module to control the door lock.

#### 4.4 Standard connection (recommended, not obligatory) <sup>4)</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 (0 V) |
|            | Output 1 | Door lock control (open collector 24V/2A, 0V active)                                 |

Table 7: Standard connection

#### 4.5 D1 LED indication

|                |        |   |   |
|----------------|--------|---|---|
| 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 |
|                |        | Fast switching followed green LED with 2s period  | Address setting mode                      |
|                | Green  | ID media reading  |   |
|                | Yellow | Controlled by the controller's program <sup>4)</sup> , copies 2nd output status (AuxOutput) |   |

Table 8: LED indicators

|  |
|--|
| <sup>4)</sup> The function of inputs and outputs is defined by user's programming of the controller. |
|--|

#### 4.6 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 perform 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.

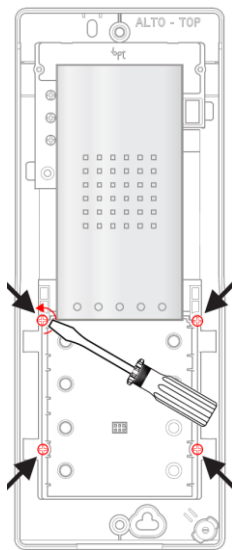
## 4.7 Mounting and removal the NREM 80 ThanGH module

### 4.7.1 Module mounting

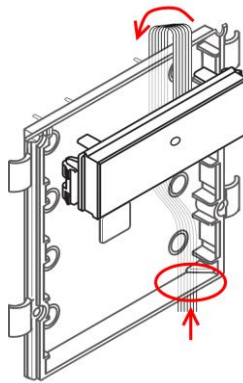
The first step is to unscrew all four screws holding the plastic lower cover for placing push buttons (thereinafter cover) of the *Thangram* panel (pic. 4a), then remove the cover. *Cut off the arrest* located at the bottom side of the cover as shown in the picture 4c. Then *place the reader module in desired position* and lead the cables as shown in picture 4b, that is *bend the cable over the top edge of the cover* and lead it behind the cover downwards. It is not necessary to place the reader module in the top position of the cover, it can be placed at any position of buttons; the cable must be lead similarly as shown in the picture. Then place the cover back to the panel with cable lead as shown in picture 4d. It is handful to lead appropriate wires *along the walls* of the panel upwards to the *power supply* and *door lock* contacts, and the rest of the wires *through the back side* of the panel. The last step is reassembling the cover in the installation box and screwing it in (pic. 4e).

### 4.7.2 Module removal

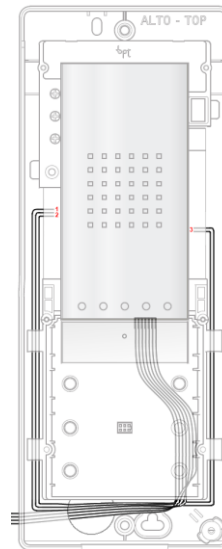
When disassembling the module use a similar procedure as described in the previous chapter, just remember to *unplug the panel and the reader module from the power supply first!*



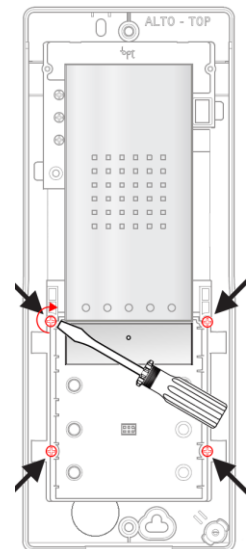
Pic. 4a



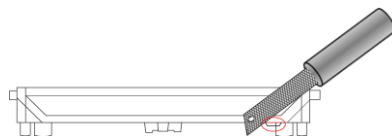
Pic. 4b



Pic. 4d



Pic. 4e



Pic. 4c



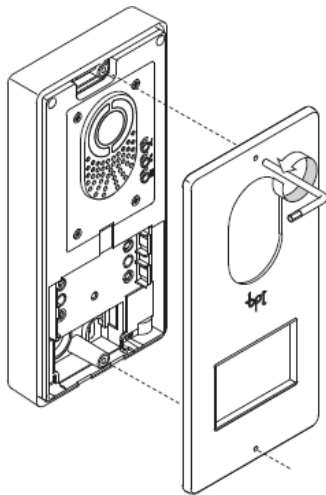
## 4.8 Mounting and removal the NREM 80 LithGH module

### 4.8.1 Module mounting

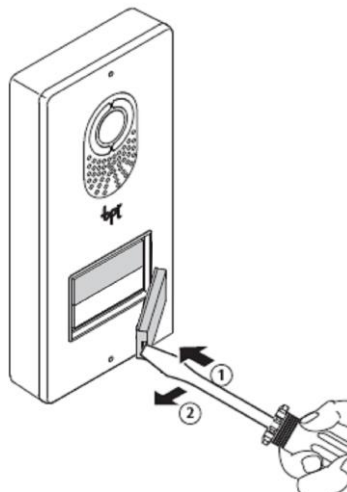
When mounting the module it is necessary to unscrew the *front metal plate* of the *Lithos* panel (pic. 5a). Then remove the *bottom pushbutton* (pic. 5b). *Uncover the plastic strip* (pic. 5c) and connect the appropriate wires according to the instructions for standard reader module connection. Lead the rest of the wires through the rear part of the panel (pic. 5d). Connect the cables in the way to be placed under the plastic strip, *insert the module* in the *bottom pushbutton position* (pic. 5e) and place the plastic strip back again. Fasten the front metal plate of the panel back again (pic. 5a – screw in the opposite way).

### 4.8.2 Module removal

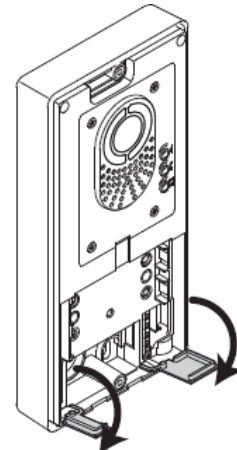
When disassembling the module use a similar procedure as described in the previous chapter, just remember to *unplug the panel and the reader module from the power supply first!*



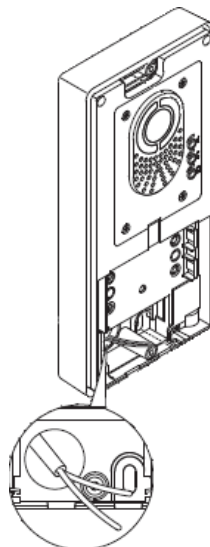
Pic. 5a



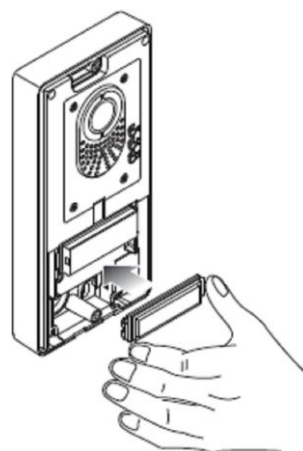
Pic. 5b



Pic. 5c



Pic. 5d



Pic. 5e

## 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              |
| 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 9: 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 80* 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 Invert transistor output option**

The function can be used when it is required to control a reverse lock. The setting is available in the *APS 400 Network Reader* program.

## **7 Useful links**

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