

MCA 168.2

APS 400 system programmable controllers

User's guide



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2 Product description

The user *programmable APS 400 system controller MCA 168.2* comes with rich hardware equipment and increased resistance against external impacts.

The controller is designed for control of *up to 64 network modules* (addresses). Ethernet and RS 232 (for service purposes) are available for connecting the module to with the configuration and system management software.

The MCA 168 controller is delivered inside a cover suitable for DIN rail mounting (*table 1*).

3 Technical features

3.1 Mechanical design

Design	Weight	0,5 kg
	Operating temperature	-10 ÷ 40 °C
	Humidity	Max. 75%, non-condensing
	Environment	Indoor
	Dimensions	12 DIN units, low profile

Table 1: Mechanical design of MCA 168

3.2 Technical parameters

Technical features	Supply voltage		10 ÷ 15 VDC
	Current demand	Typical	125 mA,
		Maximal	600 mA
	RAM	MCA 168.1	256 kB
		MCA 168.2	1 MB
	RAM and RTC backup		1000 mAh (5 years)
	Inputs		8x logical, galvanic separated
	Outputs		2x relay change over contact 1A/24 V 6x relay normally open contact 1A/24 V
	Indicators		22x LED (inputs, outputs, communication, supply voltage, network module searching), 1x PIEZO buzzer
	Tamper protection		Galvanic separated input for external NC contact
	Communication interface		Ethernet – RJ 45 RS 232 – service connector CANON 9 PIN RS 485 – APS BUS galvanic separated

Table 2: Technical features of MCA 168

3.3 Basic properties of the single controller system

Basic properties	Maximal number of reader modules (addresses) ¹⁾	64
	Maximal number of cards	Acc to configuration (tab. 4)
	Maximal number of access groups	128
	Maximal number of time frames	64
	Maximal number of holidays	64
	Maximal number of transactions	Acc to configuration (tab. 4)

Tab. 3: Basic properties

Memory configuration	Number of ID ²⁾	Events archive size
	10	57 728
	50	57 310
	100	57 230
	200	57 060
	500	56 878
	1 000	56 446
	2 000	55 582
	5 000	52 942
	15 000	44 190

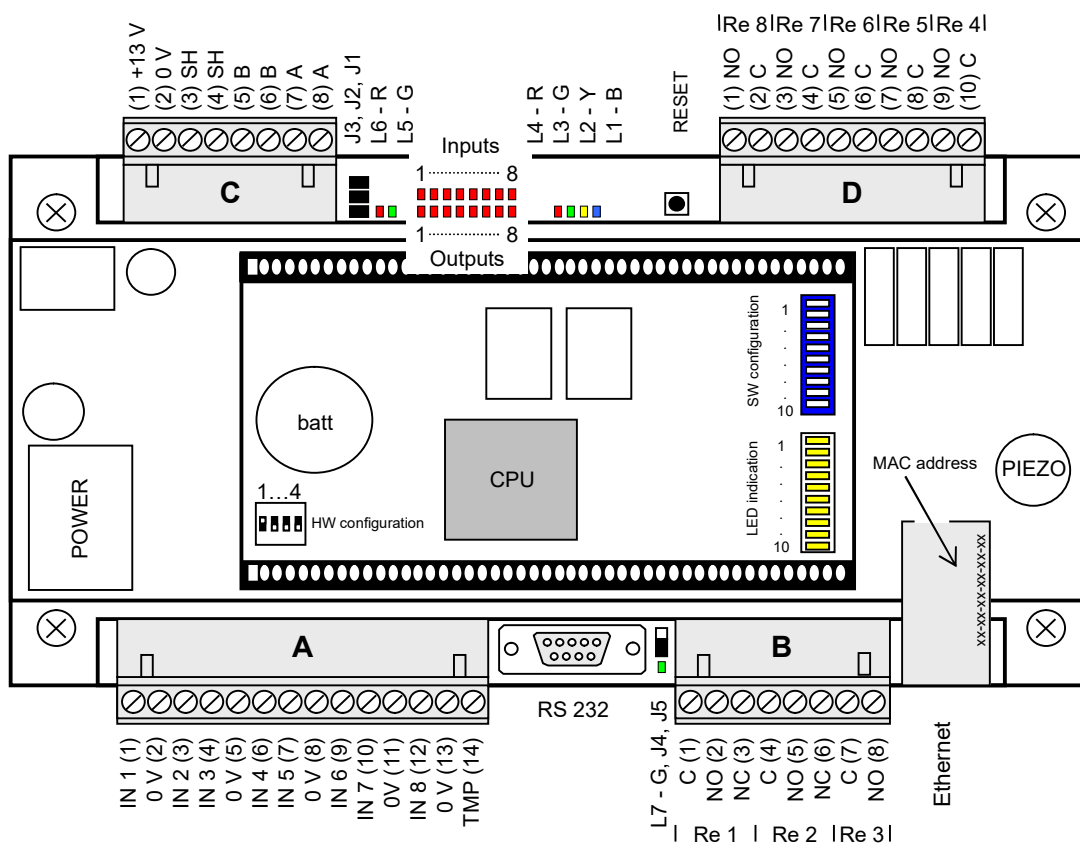
Tab. 4: Memory configuration of the controllers

¹⁾ When connected more than 32 physical devices the communication repeater has to be used.

²⁾ ID validity verification can be realized via an online linkage to external data sources (SQL Server, etc.) as well. Maximum number of ID goes to tens of millions.

4 Installation

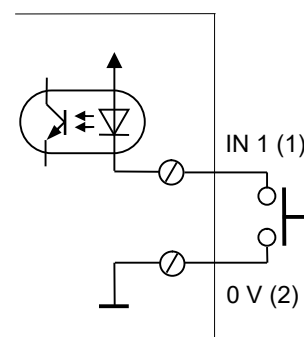
4.1 Terminals, jumpers, switches, LED indicators



Pic. 1: Terminals, jumpers, switches, LED indicators

Terminal block A	1	Input 1
	2	0 V
	3	Input 2
	4	Input 3
	5	0 V
	6	Input 4
	7	Input 5
	8	0 V
	9	Input 6
	10	Input 7
	11	0 V
	12	Input 8
	13	0 V
	14	Tamper

Table 5: Terminal block A



Pic. 2: A schematic diagram of the input connection

Terminal block B	1	Relay1 C
	2	Relay1 NO
	3	Relay1 NC
	4	Relay2 C
	5	Relay2 NO
	6	Relay2 NC
	7	Relay3 C
	8	Relay3 NO

Table 6: Terminal block B

Terminal block C	1	Supply voltage +13,8 V
	2	Supply voltage 0 V
	3	RS 485 – shield
	4	RS 485 – shield
	5	RS 485 – B
	6	RS 485 – B
	7	RS 485 – A
	8	RS 485 – A

Table 7: Terminal block C

Terminal block D	1	Relay8 NO
	2	Relay8 C
	3	Relay7 NO
	4	Relay7 C
	5	Relay6 NO
	6	Relay6 C
	7	Relay5 NO
	8	Relay5 C
	9	Relay4 NO
	10	Relay4 C

Table 8: Terminal block D

Indicating LEDs and button	L1	Power supply
	L2	Netw. module searching
	L3	Communication with PC
	L4	Network module lost
	L5	APS BUS – Rx
	L6	APS BUS – Tx
	L7	RS 232 active ¹⁾
	Inputs ²⁾	
	Outputs ²⁾	
	Reset (HW reset)	

Table 9: LEDs and button

¹⁾ The choice of the active communication channel is set by jumpers J4 and J5 (see below). We strongly recommend to use Ethernet for common usage; RS 232 is used for service purposes.

²⁾ The signalization of current inputs and outputs status. LED status indication matches corresponding inputs and outputs.





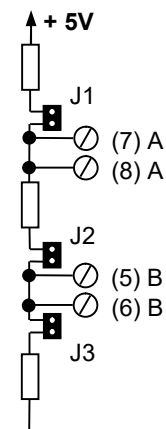
Propojky J1-J5, HW konfigurace	J1	Idle state definition (A)
	J2	Terminating resistor on
	J3	Idle state definition (B)
	J4	 ... RS 232
	J5	
		 ... Ethernet
		Operating mode
		Factory use

Table 10: HW configuration



Pic. 3: Communication jumpers

SW configuration	1	Address (bit 0)
	2	Address (bit 1)
	3	Address (bit 2)
	4	Address (bit 3)
	5	Interruption of macros enabled
	6,7	Reserved (ON)
	8,9	Reserved
	10	Memory erase after restart

Table 11: SW configuration

LED bar-graph	1	Tx1 (APS Bus)
	2	Rx1 (APS Bus)
	3	Tx0 (PC)
	4	Rx0 (PC)
	5-9	Reserved
	10	Power supply

Table 12: LED bar graph

5 Parameters setting

5.1 Network interface configuration

The default factory setting of the IP address is **192.168.1.254**, to change it, prepare a computer that will be connected to the same network (e.g. with the address 192.168.1.10) and proceed as follows:

- Connect the module to a network, connect the power supply.
- *In the administrator mode* run the command line with the command: **cmd**.
- Delete the **ARP** table with the command: **arp -d**.
- Insert a static record in the **ARP** table with the command: **arp -s IP_address MAC_address**. Ask network manager for specific **IP_address**, **MAC_address** is printed on the network interface (*Picture 1*).
- Use command **telnet IP_address 1** to insert the **IP address** in the **ARP** table (telnet shows an error message after a while).
- Use command **telnet IP_address 9999** to enter the configuration menu of the controller (an immediate keystroke (**Enter**) is requested).
- In the main menu, select **0 Server** and set the **IP interface** parameters, thus IP address, network mask, default gateway address, or DNS server address. If the system is not connected to dedicated network, it is recommended to set the configuration interface password. *Note:* The network mask is entered as the number of bits reserved for the computer number, for example the mask 255.255.255.0 corresponds to the value 8, the mask 255.255.255.252 to the value 2, etc.
- Save the configuration by choosing **9 Save and Exit**.
- The controller is ready to communicate on **IP_address:10001** (factory default setting of the IP port).

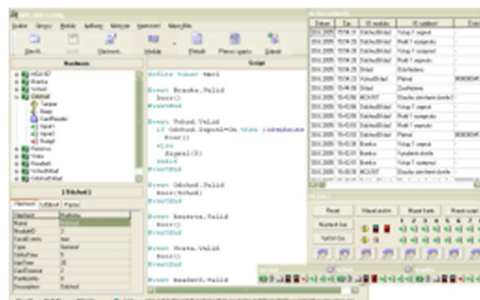
5.2 Serial channel configuration

The serial channel is factory configured and its parameters do not need to be changed. If they change, communication with the control module will fail. Setting the correct parameters can be proceeded as follows:

- Use command **telnet IP_address 9999** to enter the configuration menu of the controller (an immediate keystroke (**Enter**) is requested).
- In the main menu, select **1 Channel** and set the serial channel parameters:
 - **Baudrate: 57600.**
 - **I/F Mode: 7C.**
 - **Flow: 00.**
 - **Port No: 10001** (the default value of the IP port on which the controller expects a server connection, the port can be changed if necessary, an identical change of settings must then be done in the server configuration as well).
 - **ConnectMode: C0.**
 - **Datagram Type: 00.**
- Save the configuration by choosing **9 Save and Exit**.
- The controller is ready to communicate on **IP_address:IP_Port**.

5.3 Programming

For the MCA 168 system controller programming is the **APS 400 Config** (Pic. 4) program available on the manufacturer's web site (www.techfass.com). The program contains all the tools needed for programming the APS 400 system, including simple diagnostics and online visualization of the status of system resources with the option of controlling outputs, etc.



Pic. 4: APS 400 Config

The program defining the behavior of the system can be written in a simple programming language developed specifically for the APS 400 system. When the program is compiled and uploaded to the MCA 168 controller, an online PC connection to the system is not necessary for normal operation.

The control of the program in the MCA 168 controller is “events driven”. It means changes of various system states, to which the required reaction is defined by the user program:

- Status change (on / off) of each input.
- Reading in the card ID (valid / invalid / unknown).
- Remote commands (up to 64 events).
- Periodically triggered events (1s and 10s timers).
- Tamper contact violation.

The program can operate with numeric registers (variables), timers, test various status flags of particular system modules etc. Thanks to this the complex applications can be created without necessity of other hardware or software installation.

For standard access control system functions (e.g. granting access to the door after the valid card is read), are available simple commands which ensures executing of the more complex algorithm.

5.4 APS 400 system management

Software for the system management consists of basic APS Administrator and APS Server software package (essential for all applications) and optional software extensions which provides various types of specific applications.

The software solution is based on Client / Server architecture; it contains communication service, SQL database and HTTP server (for Web applications only). Client programs are always multi-user for network environment. The communication with servers uses TCP/IP. Some of the software modules are available both as a Windows application and as a web application and can therefore become part of a company's intranet.