

MODBUS



Instructions concerning the implementation of Modbus
TCP/IP on PROXIMA and SUPERIA series control units

1 DESCRIPTION

PROXIMA series control units with firmware v.1.4.0 or higher and equipped with a PRXGDO or CHPLUS01 hardware key and SUPERIA series control units with firmware v.1.1.9 or higher and equipped with a PRXGDO, CHPLUS01, CHPLUS02 or CHPLUS03 hardware key can exchange data with automation systems that use the Modbus TCP/IP communication protocol.

2 CONFIGURATION

 *The control unit has Slave ID = 1 (this value cannot be changed).*

While programming the control unit with the BrowserOne software, go to the **General options** page, **Modbus** tab, and set the following properties:

▼ Enable commands

Allows the transmission of Modbus commands towards the control unit (see ch. 3.2). Some commands (arming, disarming, inclusion, exclusion) have to be enabled separately.

▼ Enable command arming/disarming sector

Allows sending commands for arming and disarming sectors ("general arming", "general max security arming", "sector X arming" and "sector X max security arming" commands).

▼ Enable zone inclusion/exclusion command

Allows sending commands for including and excluding inputs ("input X exclusion" command).

▼ Enable command password

If active an authentication (see ch. 3.3) is required to send commands.

▼ Enable password elapse on each command

If active the authentication becomes invalid immediately after the first subsequent command: the Modbus client will have to prepend the authentication to each command.

▼ Password expiration time

If a value different from "Disable" is set, the authentication expires and needs to be renewed after the chosen time.

▼ Modbus connection ports

Activate the TCP ports used for communication between the Modbus client and the control unit. The ports have to be the ones used by the Modbus client. Default: Port 1 = 502, Port 2 = 10502.

▼ Write user access to history

If active user access through Modbus is recorded in the event history log.

3 MODBUS FUNCTIONS

3.1 Meaning of states sent by the control unit

Address/range		Description	Function	Variable type
0x0000	0	Status of the communication with the control unit 0: error; 1: ok; 2: wrong password	FC3	Unsigned integer
0x0001	1	Status of the communication with the control unit 0: errore; 1: ok	FC2	INPUT (0/1)

Address/range		Description	Function	Variable type
0x0100	256	Control unit power supply anomaly status 0: ok; 1: anomaly	FC2	INPUT (0/1)
0x0101	257	Control unit battery anomaly status 0: ok; 1: anomaly	FC2	INPUT (0/1)
0x0102	258	Control unit tamper status 0: ok; 1: anomaly	FC2	INPUT (0/1)
0x0103	259	PSTN anomaly status (PROXIMA control units only) 0: ok; 1: anomaly	FC2	INPUT (0/1)
0x0104	260	GSM / LTE anomaly status 0: ok; 1: anomaly	FC2	INPUT (0/1)
0x0105	261	Sensor power supply 1 anomaly status 0: ok; 1: anomaly	FC2	INPUT (0/1)
0x0106	262	Sensor power supply 1 anomaly status 0: ok; 1: anomaly	FC2	INPUT (0/1)
0x0107	263	Siren power anomaly status 0: ok; 1: anomaly	FC2	INPUT (0/1)
0x0180	384	Temperature in tenths of a Celsius degree, signed 0x8000 (−32768) = invalid temperature	FC3	Signed integer
0x0200	512	Control unit alarm (general relay) 0: ok; 1: alarm	FC2	INPUT (0/1)
0x0201	513	Control unit tampering (tamper relay) 0: ok; 1: tamper	FC2	INPUT (0/1)
0x0401	1025	Not armable sectors (at least one) 0: all sectors armable; 1: at least one sector not armable	FC2	INPUT (0/1)
0x0402	1026	Armed sectors (at least one) 0: none; 1: at least one armed sector	FC2	INPUT (0/1)
0x0403	1027	Sectors armed with max security (at least one) 0: none; 1: at least one armed sector	FC2	INPUT (0/1)
0x0404	1028	Sectors with alarmed inputs (at least one) 0: none; 1: at least one with alarmed inputs	FC2	INPUT (0/1)
0x0405	1029	Sectors with input alarm memories (at least one) 0: none; 1: at least one with inputs alarm memories	FC2	INPUT (0/1)
0x0406	1030	Excluded inputs (at least one) 0: none; 1: at least one excluded input	FC2	INPUT (0/1)
0x1001 - 0x1400	4097 - 5120	Input 1 - 1024 alarm status 0: idle; 1: alarm	FC2	INPUT (0/1)
0x1401 - 0x1440	5121 - 5184	Sector 1 - 64 alarm status 0: idle; 1: alarm	FC2	INPUT (0/1)
0x1501 - 0x1900	5377 - 6400	Input 1 - 1024 memory status 0: idle; 1: memory	FC2	INPUT (0/1)
0x1901 - 0x1940	6401 - 6464	Sector 1 - 64 memory status 0: idle; 1: memory	FC2	INPUT (0/1)
0x2001 - 0x2400 0x2001 - 0x27F8	8193 - 9216 8193 - 10232	Input 1 - 1024 exclusion status (PROXIMA) Input 1 - 2040 exclusion status (SUPERIA) 0: included; 1: excluded	FC2	INPUT (0/1)
0x3001 - 0x3040	12289 - 12352	Sector 1 - 64 arming status 0: disarmed; 1: armed	FC2	INPUT (0/1)
0x3101 - 0x3140	12545 - 12608	Sector 1 - 64 max security arming status 0: disarmed; 1: armed	FC2	INPUT (0/1)
0x3201 - 0x3240	12801 - 12864	Sector 1 - 64 armable 0: not armable; 1: armable	FC2	INPUT (0/1)
0x3301 - 0x3320 0x3301 - 0x3340	13057 - 13088 13057 - 13120	Control devices 1 - 32 tampering (PROXIMA) Control devices 1 - 64 tampering (SUPERIA) 0: ok; 1: tampering	FC2	INPUT (0/1)

Address/range		Description	Function	Variable type
0x3401 - 0x3420 0x3401 - 0x3440	13313 - 13344 13313 - 13376	RS-485 devices 1 - 32 tampering (PROXIMA) RS-485 devices 1 - 64 tampering (SUPERIA) 0: ok; 1: tampering	FC2	INPUT (0/1)
0x3501 - 0x3520 0x3501 - 0x3540	13569 - 13600 13569 - 13632	RS-485 devices 1 - 32 anomaly (PROXIMA) RS-485 devices 1 - 64 anomaly (SUPERIA) 0: ok; 1: anomaly	FC2	INPUT (0/1)
0x3601 - 0x3640	13825 - 13888	Active 2K peripherals 1 - 64 dead battery 0: ok; 1: dead battery	FC2	INPUT (0/1)
0x3701 - 0x3740	14081 - 14144	Active 2K peripherals 1 - 64 missed supervision memory 0: ok; 1: missed supervision memory	FC2	INPUT (0/1)
0x4001 - 0x4400 0x4001 - 0x47F8	16385 - 17408 16385 - 18424	Input 1 - 1024 missed supervision memory (PROXIMA) Input 1 - 2040 missed supervision memory (SUPERIA) 0: ok; 1: missed supervision memory	FC2	INPUT (0/1)
0x5001 - 0x5400 0x5001 - 0x57F8	20481 - 21504 20481 - 22520	Output 1 - 1024 status (PROXIMA) Output 1 - 2040 status (SUPERIA) 0: idle; 1: active	FC1 FC2	COIL (0/1) INPUT (0/1)
0x6001 - 0x6400 0x6001 - 0x67F8	24577 - 25600 24577 - 26616	Input 1 - 1024 alarm status (PROXIMA) Input 1 - 2040 alarm status (SUPERIA) 0: idle; 1: alarm	FC2	INPUT (0/1)
0x7001 - 0x7400 0x7001 - 0x77F8	28673 - 29696 28673 - 30712	Input 1 - 1024 memory status (PROXIMA) Input 1 - 2040 memory status (SUPERIA) 0: idle; 1: memory	FC2	INPUT (0/1)
0x8001 - 0x8400 0x8001 - 0x87F8	32769 - 33792 32769 - 34808	Input 1 - 1024 dead battery status (PROXIMA) Input 1 - 2040 dead battery status (SUPERIA) 0: idle; 1: dead battery	FC2	INPUT (0/1)
0x9001 - 0x9400 0x9001 - 0x97F8	36865 - 37888 36865 - 38904	Input 1 - 1024 exclusion for gate access status (PROXIMA) Input 1 - 2040 exclusion for gate access status (SUPERIA) 0: included; 1: excluded	FC2	INPUT (0/1)

The table lists all Modbus registers whose values are automatically updated by the control unit.

In addition to automatically updating values, **SUPERIA** control units can also write any value on any Modbus register by using the "Modbus virtual register" element in BrowserOne's logic elaborations editor.

This lets you create a customized mapping and send states that are not listed in the table.

Enter the following data in the element: the address of the register to write to, the Modbus function code to use and (if the chosen function code allows it) a value. When the element is active, the register with the chosen address takes on the chosen value (or 1 if the chosen function code does not allow a value to be set); when it is not active, the register takes on the value 0.

If the element is set to write values to a register whose address appears in the table, the register will contain the values written by the element instead of those indicated in the table: it is preferable to enter only addresses not present in the table in the element.

3.2 Commands that can be sent to the control unit

Address/range		Description	Function	Variable type
0x0100	256	General arming command (all sectors) 0: disarming; 1: arming	FC5	COIL (0/1)
0x0101	257	General max security arming command (all sectors) 0: disarming; 1: arming	FC5	COIL (0/1)
0x2001 - 0x2400 0x2001 - 0x27F8	8193 - 9216 8193 - 10232	Input 1 - 1024 exclusion command (PROXIMA) Input 1 - 2040 exclusion command (SUPERIA) 0: excluded input; 1: active input	FC5, FC15*	COIL (0/1)
0x3001 - 0x3040	12289 - 12352	Sector 1 - 64 arming command 0: disarming; 1: arming	FC5, FC15*	COIL (0/1)
0x3101 - 0x3140	12545 - 12608	Sector 1 - 64 max security arming command 0: disinserimento; 1: inserimento	FC5, FC15*	COIL (0/1)
0x4401 - 0x4800 0x4401 - 0x4BF9	17409 - 18432 17409 - 19449	Remote input 1 - 1024 command (PROXIMA) Remote input 1 - 2040 command (SUPERIA) 0 = idle; 1 = alarm; 2 = tampering	FC5, FC15* FC6	COIL (0/1) 0/1/2

Address/range		Description	Function	Variable type
0x5001 - 0x5400	20481 - 21504	Output 1 - 1024 activation/deactivation command (PROXIMA)	FC5, FC15*	COIL (0/1)
0x5001 - 0x57F8	20481 - 22520	Output 1 - 2040 activation/deactivation command (SUPERIA) 0: not active; 1: active		

* function FC15 allows sending multiple commands (commands valid for multiple addresses); the command will be considered successful if at least one command is successful; if no command is successful the "SERVER DEVICE FAILURE" message will be returned.

3.3 Sending access credentials via Modbus

If, while programming the control unit, the **Enable command password** function (see ch. 2) has been activated, the Modbus client needs to send the user code and the password, followed by a password verification command.

If, while programming the control unit, the **Simplified codes mode** function (which allows to omit the user code) has also been activated, the Modbus client too will have to send just the password, followed by the password verification command.

Address/range		Description	Function	Variable type
0xFF01 - 0xFF08	65281 - 65288	User code digits "0" (0x30) – "9" (0x39); input "?" (0x3F) for an empty digit	FC6, FC16	ASCII
0xFF09 - 0xFF10	65289 - 65296	Password digits "0" (0x30) – "9" (0x39); input "?" (0x3F) for an empty digit	FC6, FC16	ASCII
0xFF11	65297	0: logout command; 1: password verification command	FC6, FC16	0/1

Characters can be sent one at a time or with a single *multiple command*.

If they are sent one at a time, the comparison between the password stored in the control unit and the one sent character by character only takes place after sending the verification command.

Example #1

Accessing a control unit without **Simplified codes mode**, using user 128 (password 123456).

Write the following registers, starting from address 0xFF01:

0x0031 (1), 0x0032 (2), 0x0038 (8) 0x003F (?) 0x003F (?) 0x003F (?) 0x003F (?) 0x003F (?)
0x0031 (1), 0x0032 (2), 0x0033 (3) 0x0034 (4) 0x0035 (5) 0x0036 (6) 0x003F (?) 0x003F (?)
0x0001 (verification)

Example #2

Accessing a control unit with **Simplified codes mode**, using a user with password 987654.

Write the following registers, starting from address 0xFF09:

0x0039 (9), 0x0038 (8), 0x0037 (7) 0x0036 (6) 0x0035 (5) 0x0034 (4) 0x003F (?) 0x003F (?)
0x0001 (verification)

Example #3

Accessing a control unit without **Simplified codes mode**, with an installer profile (user 000, password 88888888).

Write the following registers, starting from address 0xFF09:

0x0030 (0), 0x0030 (0), 0x0030 (0) 0x003F (?) 0x003F (?) 0x003F (?) 0x003F (?) 0x003F (?)
0x0038 (8), 0x0038 (8), 0x0038 (8), 0x0038 (8), 0x0038 (8), 0x0038 (8), 0x0038 (8), 0x0038 (8)
0x0001 (verification)

To know the usage status of the password, use the following command:

Address/range		Description	Function	Variable type
0xFF00	65280	0: disabled / not in use; 1: not valid; 2: valid	FC3	Unsigned integer