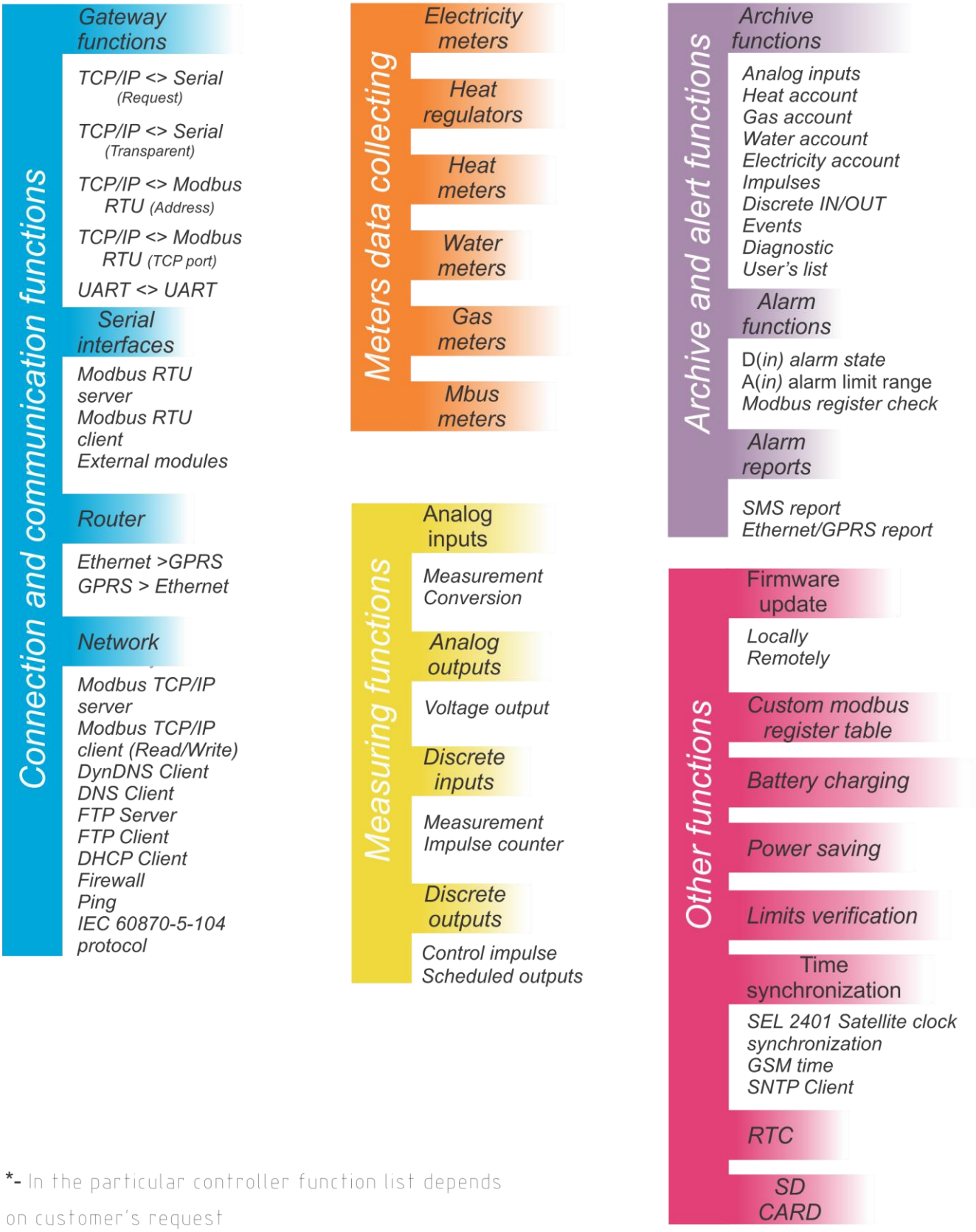
Function list (common to all MPC controllers)*

Graphical tree



*- In the particular controller function list depends on customer's request

Description (common to all MPC controllers)*

Connection and communication functions

	FUNCTION	EXPLICATION
Gateway functions	TCP/IP<>Serial (Request)	Data exchange with terminal device, when terminal device directly answers (one by one (FIFO method), after the response to previous query or after a specified period of time (TimeOUT)) to a high level system's request, is called “Routing TCP/IP-serial (request). Data transfer can be initiated only from high level system sides. At one time data can be sent only in one direction (request or answer).
	TCP/IP<>Serial (Transparent)	Data exchange between terminal device and high level system, when terminal device directly send data to a high level system (data from terminal device, which is connected to one of serial interface, is added to the TCP packet and redirected to high level system) and/or vice versa is called "TRANSPARENT". Data transfer can be initiated from both sides. And can work bidirectional at the same time.
	TCP/IP<>Modbus RTU (Address)	Is used for range of addresses routing to Modbus RTU Client. This is used to route all data, which Modbus RTU address is in set range. If you know address of external Modbus RTU device, that is connected to Master controller, then connecting through Ethernet or GPRS you can assign connected devices (this can be any device, connected to controller through Modbus RTU client).
	TCP/IP<>Modbus RTU (TCP port)	Route data, depending on TCP port. For each Modbus RTU client assign a separate port. This option is similar to Modbus RTU (Address), using it, you can assign any to the controllers Modbus RTU client connected device through set TCP port. Accessing this port you will automatically routed to set Modbus RTU client.
	UART<>UART	Function allows to route data from master UART to 1 or 2 slave UARTS
Serial interfaces	Modbus RTU server	Modbus RTU server is used to enable local devices to query controller using Modbus RTU protocol.
	Modbus RTU client	Allow controller to read data from devices connected to controller using Modbus RTU protocol.
	External modules	Allows to connect other Modbus RTU devices and extend controller’s possibilities.
Routing functions	Ethernet > GPRS GPRS > Ethernet	Routing functions are used to extend possibilities of local networks. They enable remote users (over Ethernet and/or GPRS) to connect and setup local area devices.
Network functions	Modbus TCP/IP server	Modbus TCP/IP server is used to establish remote connection to the controller.
	Modbus TCP/IP client	This function enables controller to get data from remote devices using Modbus TCP/IP protocol.
	DynDNS Client	This function is used for periodical communicate with DynDNS servers and ensure that you will know controllers IP address in networks where you can‘t have static IP.
	DNS Client	Is used to resolve names.
	FTP Server	This function allows you to connect to controller using FTP client and read data, that can be stored as *.csv.
	FTP Client	This function allows controller to store data to remote FTP server. Controller can be configured to store current values or data from

		archive.
	DHCP Client	Function used to get dynamic IP address from network provider.
	Firewall	Using Firewall your controllers are safe from unauthorized access.
	Ping	This function allows controller to send PING‘s over Ethernet interface
	IEC 60870-5-104 protocol	Special data exchange protocol.

Meters data collecting

FUNCTION	EXPLICATION
Electricity meter	Used to read data from Electricity meters.
Heat meter	Used to read data from Heat meters.
Heat regulators	Used to read data and control Heat regulators.
Water meter	Used to read data from Water meters.
GAS meters	Used to read data from GAS meters.
Mbus meters (water, electricity)	Used to read data from MBus meters. MBus meters can be connecter directly or over MBus-RS232/RS485 converter. In one line can be connected up to 250 meters (with external converter). As a part of MBus meters function are auto MBus devices search procedure.

Measuring functions

	FUNCTION	EXPLICATION
Analog inputs	Measurement	Controller periodically measure signal (Current, Voltage, Resistance or other). To eliminate fluctuations controller uses time and amplitude filters.
	Conversion	Measured analog signals are converted into physical values.
Analog outputs	Control signal formation	Set analog (Voltage) control signal
Discrete inputs	Current state	Controller periodically tracks status of Discrete inputs and in case of status changes store new status with RTC record.
	Impulse counter	Each discrete input can be used as impulse counter. Sum of impulses are stored in flash. Amount of impulses can be recalculated to physical value using multiplier.
Discrete output	Control impulse	Controller has posibility to send control impulses (user set variable control impulse duration) from every discrete output. Control signals can be initiated by user or sent automaticaly on when special event occure.
	Schedule	Controller support week time Discrete output schedule.

Archive and alert functions

	FUNCTION	EXPLICATION
Archive functions	Analog inputs	Store data of all Analog channels (physical value and RTC (Real Time Clock) record).
	Heat accounting	Store values of Heat meters with RTC record.
	GAS accounting	Store values of GAS meters with RTC record.

	Water accounting	Store values of Water meters with RTC record.
	Electricity accounting	Store values of Electricity meters with RTC record.
	Impulses	Store amount of Imposes, number of Discrete channel and a RTC record.
	Discrete IN/OUT	Store Discrete channels status changes with RTC record.
	Events (Alarms)	Controllers support 3 type of Events: ➢ Deviations of Analog inputs, ➢ Discrete input status changes, ➢ One of limits has been achieved (see on **Other functions**) Archive record contains event ID, type of deviation, meaning and RTC.
	Diagnostic	Function store data about controller's system events (reboots, configuration changes, time settings, archive erasing and etc.).
	User's list	Archiving data from user's set list of registers.
Alarm functions	D(in) alarm state	By discrete channel's alarm state (Open, Close, Both cases) function initiates alarm.
	A(in) alarm limit range	If measured value of Analog input cross set range (Comes out or Returns) controller start Alarm report procedure.
	Modbus register check	If values on custom registers meets set Alarm conditions controller start Alarm report procedures.
Alarm reports	Ethernet/GPRS report	Using this functions controller establish connection and send data (serial number, IP address and event ID) to remote server on each Alert. After receiving such message is recommended to connect to controller and read full information about Alert.
	SMS report	When on Discrete inputs, Analog inputs or values on set internal registers meets alert conditions, controller send preconfigured SMS alert message.

Other functions

	FUNCTION	EXPLICATION
Firmware update	Locally	This function is responsible for firmware update over UART and USB.
	Remotely	This function is responsible for firmware update over Ethernet and GPRS.
Custom sets of registers	Modbus register field formation	Function allows user to create a set of registers. If you need to read data from various register – this quite uncomfortable. This function allows you to add all your registers in to set and read all set at once. Max supported number is 40 packets.
Battery charging	Backup battery charging	Function is responsible for charging of internat and external batteries if device such support.
Power saving	Optimization of energy consumption	Optimization of power consumption, when controller are powered from batteries, to ensure safe and long operation
Limits verification	Comparison of Modbus registers	Controller has possibility to compare value of any register (it can be analog value, counters data, time records, archives and etc.) with set Alarm limit range. Every limit has unical event code, which is used for diagnostic and reports sending.

Time functions	Time synchronization	Controller has a few time synchronization possibilities: ➢ GPS time SEL-2401, ➢ GSM time, ➢ NTP server.
	Real Time Clock (RTC)	Real Time Clock (RTC) is used to keep current real time. Time parameters are recorded with alarms and events to make them more informative.
Hardware support	SD card	Controller has possibility to extend archyve storing memory and functionality by using SD card.