PRODUCT CATALOGUE

M-Bus   M-Bus wireless   ASHRAE BACnet™   Modbus

VILTRUS
ELECTRONICS

JSC "VILTRUS" COMPANY

JSC "VILTRUS" privately-owned high-tech electronics engineering and IT solution company. We create, engineer and develop various electronic devices and IT solutions in remote control, metering, data acquisition, energy and industrial fields.

One of our main company goals is to provide state of the art, cutting edge electronic technologies to world market. We as a company are flexible engineers and manufacturers. We constantly researching, upgrading and creating new electronic and IT products and solutions for various markets starting from communication to energy and aerospace.

JSC "VILTRUS" company been founded in 1997. Since then we are strong and reliable partner for all our customers across the world.

JSC "VILTRUS" focuses on a number of key industries such as:

Metering field

- Data acquisition from any kind of meters via Modbus, M-Bus, Wireless M-Bus or any other protocol.
- Connecting M-Bus devices and to converting signals to RS232/RS485 or sending of data via 3G, GPRS or LAN.
- Connecting pulse meters and converting signals to M-Bus and send data via GPRS or LAN.

Monitoring field

- Monitoring and controlling power stations (solar, wind, hydro, and biogas) and electrical cabinets.
- Controlling and monitoring various flow systems.
- Applying internet of things.

Industrial / Building automation / Environmental and Agro fields

- Controlling and monitoring various industrial systems.
- Controlling and monitoring weather stations and advanced greenhouses.
- Data acquisition and control of various environmental monitoring systems.
- Controlling and monitoring of agro systems.
- SCADA / HMI and other applications.
- Smart houses and building automation systems.

JSC "VILTRUS" provides a wide range of products, grouped in families:

- M-Bus technologies (M-Bus Masters / M-Bus Converters).
- ModBus technologies (ModBus data loggers, data concentrators, gateways and controllers).
- Universal controllers / data concentrators (dedicated for various communication and control purposes).
- Universal advanced gateways.

VILTRUS ELECTRONICS

APPLICATION POSSIBILITIES

JSC "VILTRUS" is expert in universal data loggers, control units, signal converters and Modbus / M-Bus technologies. We apply our products to various fields and industries. JSC "VILTRUS" devices are being used in:

- Smart Cities
- Industrial metering and control
- Water metering
- Heating substation metering
- Commercial metering
- Gas metering
- Electricity metering
- Sensors monitoring
- Renewable energy monitoring
- Agro monitoring
- Railways industry
- Remote device control
- Smart house
- Internet of Things (IoT)
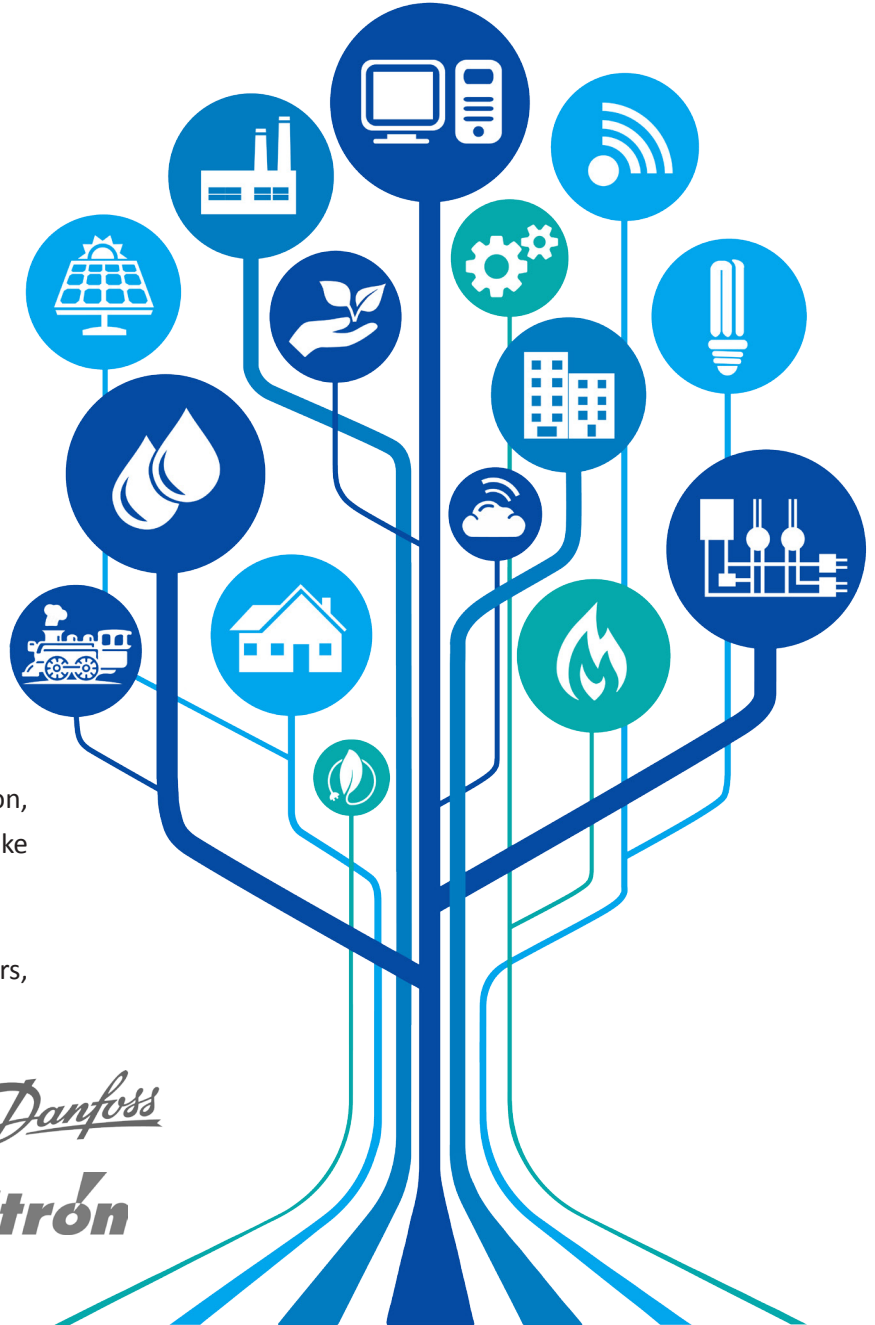
JSC "VILTRUS" devices can read:

- Kamstrup, Sensus, Diehl, Danfoss, Itron, Landis & Gyr, Apator and other meters (like exotic meters / industrial meters).

- Also can read and control other controllers, like Danfoss ECL 300.
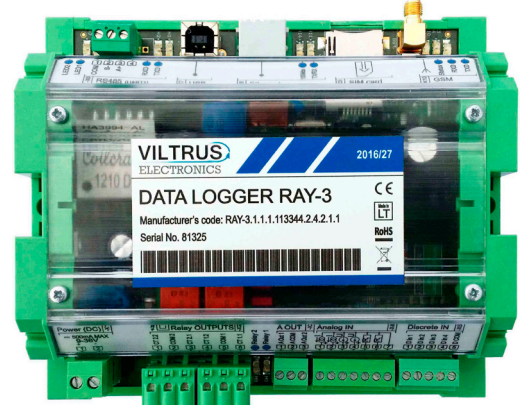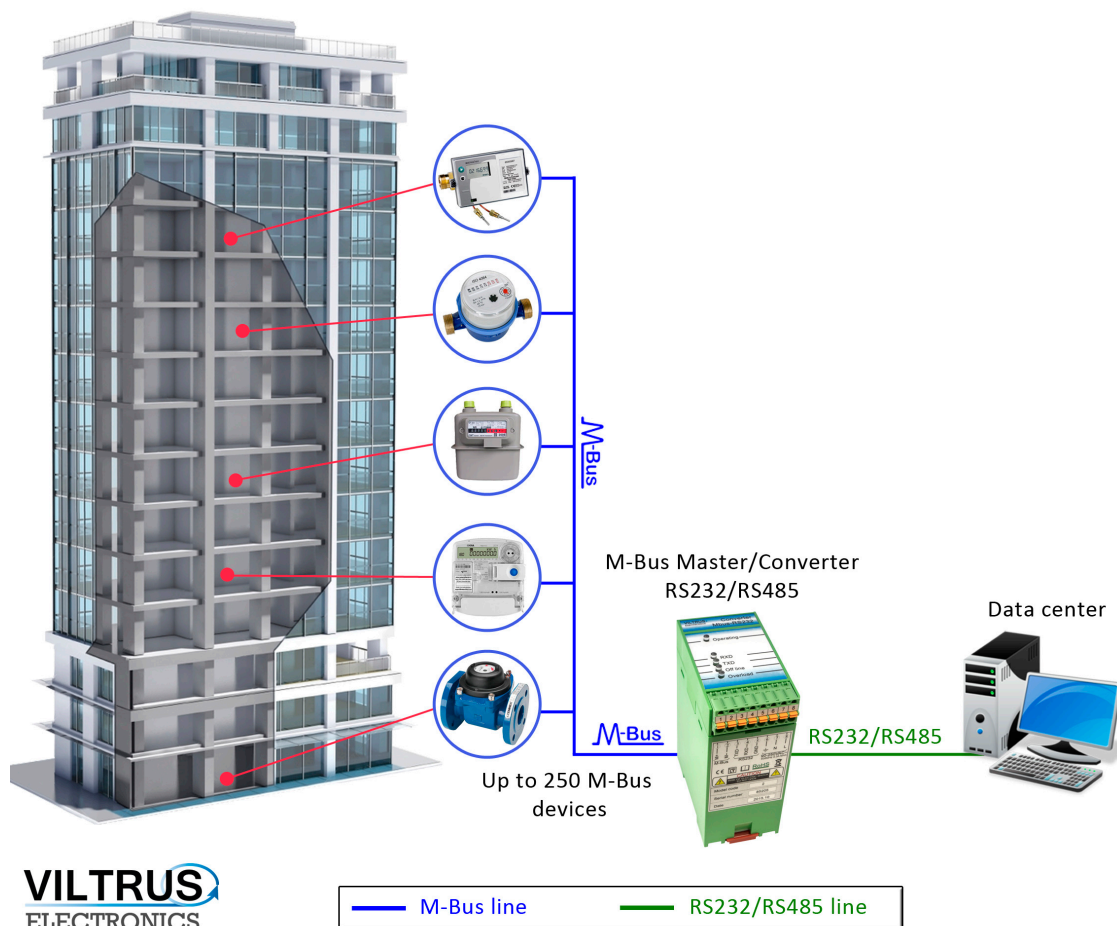
M-Bus Master / Converter

M-Bus master/converter is dedicated to convert M-Bus signal to RS232/RS485 and vice versa. Up to 250 M-Bus devices can be connected to M-Bus master/converter.

FEATURES

- Interfaces:
  - » M-Bus - up to 250 devices (375mA)
  - » RS485 - distance up to 1,2 km, max 32 transivers
  - » RS232 - distance up to 15 m
- Power supply: 90-250V~, 50-60Hz
- Galvanic isolation: >1000V
- Capacity: not loaded up to 3,5W, fully loaded up to 20W
- M-Bus line power: mark 36-40V, space 24-27V
- M-Bus short connection protection, triggering current 500 mA
- Led indication for M-Bus communication
- Operating temperature: -25..+60 °C
- Humidity range: 5-95%, non-condensing
- Dimensions: 105x75x45 mm
- Weight: 170 g
- Mounting type: on DIN rail

M-Bus system with M-Bus Master/Converter (up to 250 M-Bus meters) Application

M-Bus Master/Converter
RS232/RS485

Data center

M-Bus

Up to 250 M-Bus devices

RS232/RS485

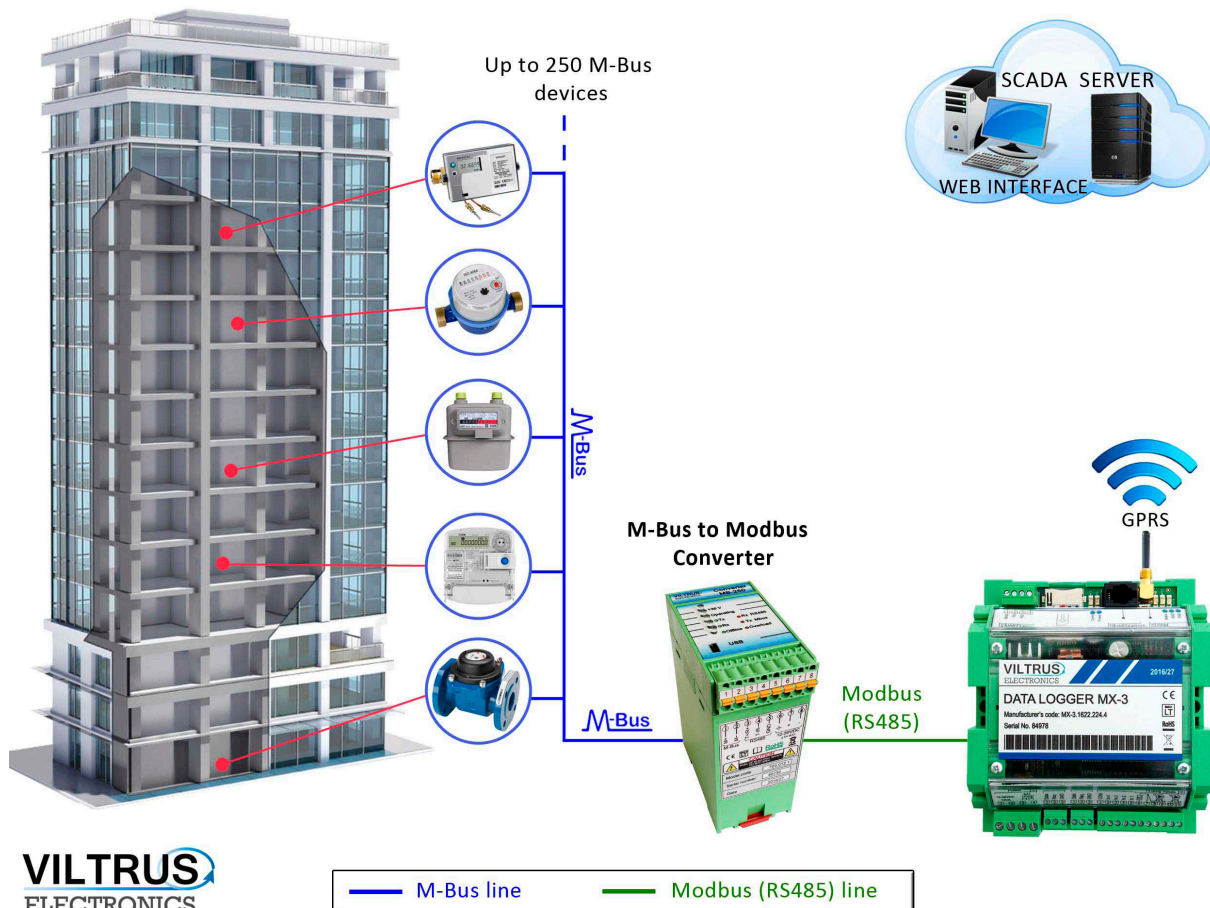| | M-Bus line | | RS232/RS485 line |

M-Bus to Modbus RTU Converter

M-Bus to Modbus RTU (RS485/RS232) Converter is dedicated to convert M-Bus signal to Modbus RTU (RS485/RS232) and to allow M-Bus devices to communicate on a Modbus network.

FEATURES

- Device versions:
  - » MB-10 Converter dedicated to support up to 10 units of M-Bus meters
  - » MB-50 Converter dedicated to support up to 50 units of M-Bus meters
  - » MB-100 Converter dedicated to support up to 100 units of M-Bus meters
  - » MB-250 Converter dedicated to support up to 250 units of M-Bus meters
- Interfaces:
  - » M-Bus - up to 10 / 50 / 100 / 250 devices
  - » RS485 - distance up to 1,2 km, max 32 transivers
  - » RS232 - distance up to 15 m
- Baud rate 38 400 Bit/s
- Power supply: 12 - 36 VDC
- Galvanic isolation: >1000V
- Operating temperature: -25..+60 °C
- Humidity range: 5-95%, non-condensing
- Dimensions: 105x75x45 mm
- Mounting type: on DIN rail
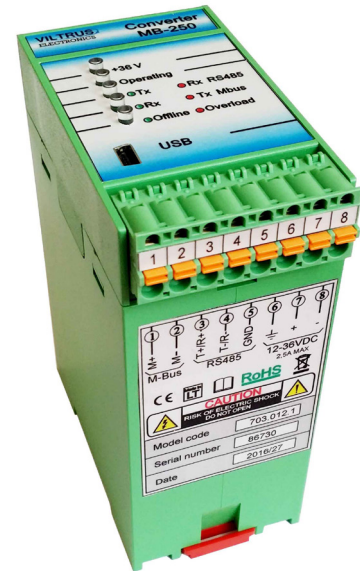
M-Bus to Modbus (RS485) Converter (up to 250 M-Bus meters) Application

Up to 250 M-Bus devices

SCADA SERVER

WEB INTERFACE

M-Bus to Modbus Converter

GPRS

Modbus (RS485)

DATA LOGGER MX-3

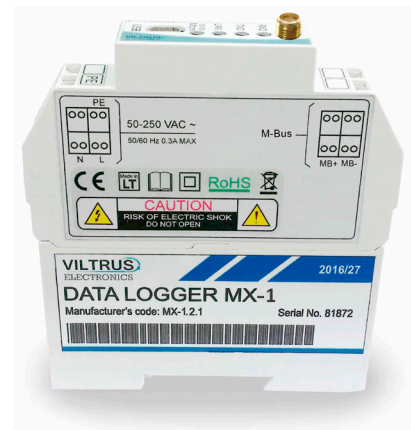— M-Bus line   — Modbus (RS485) line

MX-1 M-Bus/Modbus GPRS Data Logger

MX-1 data logger is designed for data reading from meters (electricity, heat, water, gas and others) with M-Bus (up to 30 any M-Bus devices) or Modbus interface and storing/exchanging data between device and client's software through GSM/GPRS.
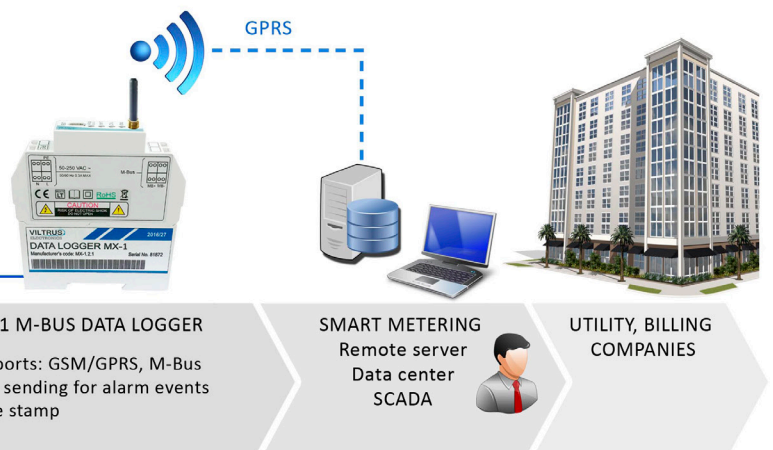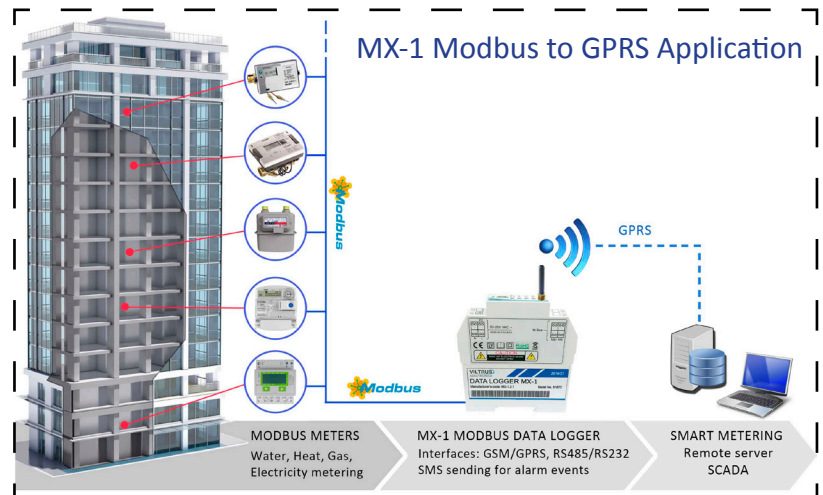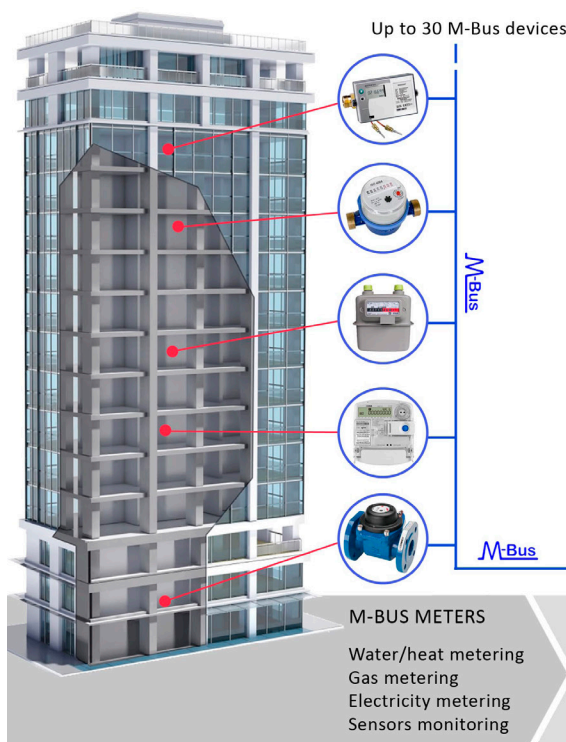
FEATURES

- Supported interfaces:
  - » M-Bus: possible to connect up to 30 M-Bus devices
  - » RS232: distance up to 15 m, speed up to 38 400 Bit/s
  - » RS485: distance up to 1,2 km, speed up to 38 400 Bit/s
  - » GPRS/GSM: 4 band 850/900/1800/1900 MHz
  - » Mini USB type B, ver. 2,0
- CPU: ARM Cortex M4
- Memory: archive storage up to 8 MB, battery backup, valid up to 5 years
- Supported protocols: Modbus RTU, Modbus TCP/IP, MQTT, IP, ICMP, UDP, TCP, DHCP, PPP, ARP, SNTP
- Memory expansion: up to 8 GB using micro SD card
- Remote communication and updates through GSM/GPRS
- Galvanically isolated interfaces and power supply
- Power supply: 50-250VAC (50-60Hz)
- Power consumption: < 9VA
- Operating temperature: -25 .. +60°C
- Humidity range: 5 – 95%, non-condensing
- Mounting type: on DIN rail

MX-1 Modbus to GPRS Application

MODBUS METERS	MX-1 MODBUS DATA LOGGER	SMART METERING
Water, Heat, Gas, Electricity metering	Interfaces: GSM/GPRS, RS485/RS232 SMS sending for alarm events	Remote server SCADA

MX-1 M-Bus to GPRS Application

Up to 30 M-Bus devices

| M-BUS METERS	MX-1 M-BUS DATA LOGGER	SMART METERING	UTILITY, BILLING COMPANIES
Water/heat metering Gas metering Electricity metering Sensors monitoring	Supports: GSM/GPRS, M-Bus SMS sending for alarm events Time stamp	Remote server Data center SCADA	

MX-2 RS232/485 Ethernet Data Logger

MX-2 data logger is designed for data reading from meters (electricity, heat, water, gas and other), storing to local archive and data exchange between RS232/RS485 and Ethernet.

FEATURES

- Reading data from meters (heat, water, gas, electricity...)
- Supported interfaces:
  - » RS232: distance up to 15 m, speed up to 38400 Bit/s
  - » RS485: distance up to 1,2 km, max 32 transivers, speed up to 38400 Bit/s
  - » Ethernet: 10/100 Mbps, RJ45, distance up to 100 m
  - » Mini USB type B, ver. 2,0
- CPU: Cortex M3
- Memory: archive storage up to 8 MB, independent data storage without power about 5 years
- Supported protocols: Modbus RTU, Modbus TCP/IP, IP, ICMP, UDP, TCP, DHCP, PPP, ARP, SNTP, IEC60870-5-104:2000 (IEC 104), DynDNS
- Remote communication over Ethernet (RJ45, 10/100 Mbps)
- Indication: LED (Power, TXD, RXD, LAN, 10/100Mbps)
- Power supply: 50-250VAC (50-60Hz), 50-250VDC or PoE (IEEE 802.3af)
- Capacity: 300mA MAX
- Dimmensions: 17x85x97 mm
- Weight: 105 g
- Operating temperature: -25 .. +60°C
- Humidity range: 5 – 95%, non-condensing
- Mounting type: on DIN rail
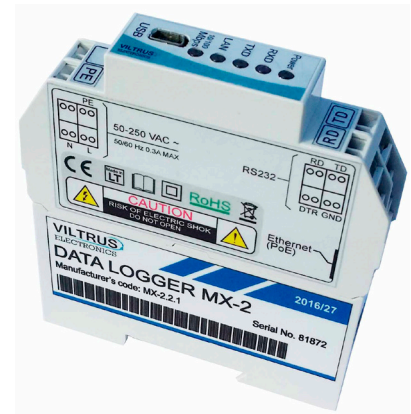
MX-2 RS232/485 Ethernet Data Logger Application
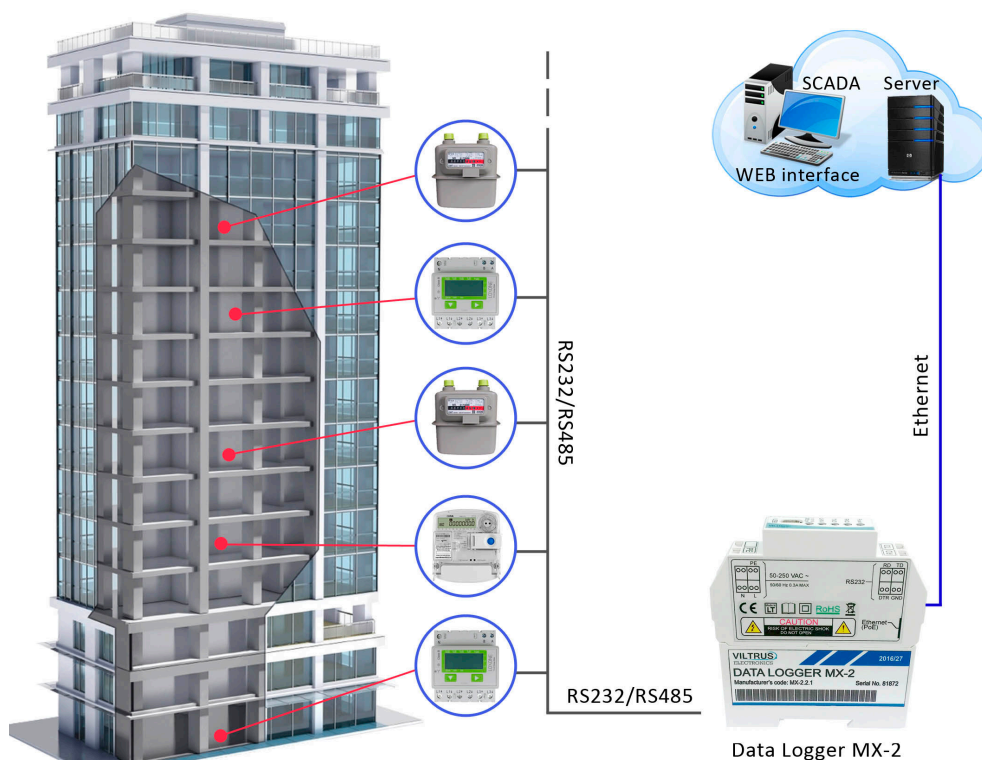
Data Logger MX-2

MX-3 GSM/GPRS Modbus Data Logger

MX-3 data logger is dedicated for real time logging and analyzing of data. Using GPRS/GSM, logger sends data to remote users / server. MX-3 can also communicate with other controllers and sensors. Device has wide range of optional interfaces and protocols and can read any kind of meters, controllers and sensors equipped with standard protocols. Perfect for telemetry/monitoring, control and smart metering.

FEATURES

- Reading data from meters (heat, water, gas, electricity...), sensors and controllers
- Independent data log with real time stamp (Real Time Clock)
- Supported interfaces: M-Bus, GSM/GPRS, RS232, RS485, Data/Req
- Up to 3 analog inputs (current, voltage, PT100 or PT1000)
- Up to 4 discrete inputs (contact, impulse counter, alarm)
- Remote communication and updates through GSM/GPRS
- Galvanically isolated interfaces and power supply
- SMS sending for alarm events
- Batteries management. The remote monitoring devices can charge the battery and use it to power supply in the event of blackout
- Supported protocols: Modbus RTU, Modbus TCP/IP, FTP server/client, IEC60870-5-104:2000 and others

TECHNICAL DATA

Interfaces		
RS232 (2 ports)	distance up to 15m, speed up to 19,2 Kbit/s	
RS485 (2 ports)	distance up to 1,2km, speed up to 19,2 Kbit/s	
Data/Req (1 port)	up to 2 devices, (Kamstrup) data transfer interface	
M-Bus (1 port)	up to 8 M-Bus devices	
GSM/GPRS	4 band 850/900/1800/1900 MHz	
Discrete IN	4	sink contacts
Analog IN	3	current 0/4-20mA, voltage 0-10V, thermoresistor PT100 or PT1000

Protocols
Modbus RTU, Modbus TCP/IP, UDP, ARP, SNTP, DynDNS, FTP server/ client, DNS client, IEC60870-5-104:2000 (IEC 104)

Climate conditions	
Operating temperature	-30 .. +60°C
Storage temperature	-40 .. +60°C
Humidity range	5-95%, non-condensing

General	
Power supply	15-36 VDC
Galvanic isolation	>1000V
Capacity	<5VA
Internal battery	3,7V 500 mAh
CPU	ARM7
Memory	archive storage up to 8 MB, data storage without power 5 years

Physical characteristics	
Dimensions	107x128x50 mm
Weight	275 g
IP protection	IP20

LED indication
Status of discrete input, for each port
Serial ports read/write for each port
GSM/GPRS modem status

Other features
Real time clock
M-Bus auto setup

MX-3 GSM/GPRS Modbus Data Logger

MX-3 data logger / gateway is suitable for data acquisition from any kind of meters using standard protocols. Our R&D department also can adjust our device to read meters via non-standard protocols.

MX-3 can read Kamstrup, Sensus, Diehl, Danfoss, Itron, Landis & Gyr, Apator and other meters (like exotic meters, industrial meters).

MX-3 can also work as controller/controll unit and even controll/read other controllers, like Danfoss ECL 300.

RS232	RS485	M-Bus	Data/Req
USB	GSM/GPRS	3 x Analog IN	4 x Discrete IN

MX-3 GSM/GPRS Data Logger Application

Up to 250 M-Bus devices

SCADA SERVER
WEB INTERFACE

GPRS

M-Bus Converter
RS232/RS485

M-Bus

RS232/RS485

M-Bus

Pulse Output

Modbus

| ▬▬ M-Bus line | ▬▬ RS232/RS485 line | ▬▬ Pulse Output line | ▬▬ Modbus line |

MX-5 GPRS/Ethernet Modbus Data Logger

MX-5 data logger is dedicated for real time logging and analyzing of data. Using GPRS/GSM or Ethernet, logger sends data to remote users / server. MX-5 can also communicate with other controllers and sensors. Device has wide range of optional interfaces and protocols and can read any kind of meters, controllers and sensors equipped with standard protocols. Perfect for telemetry/monitoring, control and smart metering.

FEATURES

- Reading data from meters (heat, water, gas, electricity...) and controllers
- Independent data log with real time stamp
- Supported interfaces: M-Bus, RS232, RS485, Current Loop, Data/Req, USB, GSM/GPRS, Ethernet
- Remote communication and updates through GSM/GPRS or Ethernet
- Galvanically isolated interfaces and power supply
- Power supply for external powering of meters
- Supported protocols: Modbus RTU, Modbus TCP/IP, M-Bus, MQTT, IEC60870-5-104:2000 (IEC 104)

TECHNICAL DATA

Interfaces	
RS232 (4 ports)	up to 15 m, speed up to 57600 bit/s
RS485 (3 ports)	distance up to 1,2 km, max 32 transivers, speed up to 57600 bit/s
Data/Req	(Kamstrup) data transfer interface
M-Bus (2 ports)	up to 16 M-Bus devices (up to 8 M-Bus devices for each M-Bus port)
Current Loop (2 ports)	25-27V, 14-20mA, up to 6 km, speed up to 57600 bit/s
GSM/GPRS	4 band 850/900/1800/1900 MHz
USB	type B, ver. 2,0
Ethernet	10/100 Mbps, RJ45, distance up to 100 m

Protocols
Modbus RTU, Modbus TCP/IP, M-Bus, DynDNS, FTP server, FTP client, DNS client, IEC60870-5-104:2000 (IEC 104), MQTT

LED indication
Power
Serial ports read/write for each port
GSM/GPRS modem status
Ethernet status

General	
Power supply	9-36 VDC / 10VA
Galvanic isolation	>1000V
Capacity	300mA max
Power for external devices	3,7/5/6/8/10 VDC (20mA)
SD card support	micro SD card up to 8 GB
CPU	ARM7
Memory	archive storage up to 8 MB, data storage without power 5 years

Climate conditions	
Operating temperature	-25 .. +60°C
Storage temperature	-40 .. +60°C
Humidity range	5-95%, non-condensing

Physical characteristics	
Dimensions	147x128x50 mm
Weight	400 g
Mounting	on DIN rail

Other features
Real time clock
M-Bus auto setup
24 months warranty period

MX-5 GPRS/Ethernet Modbus Data Logger
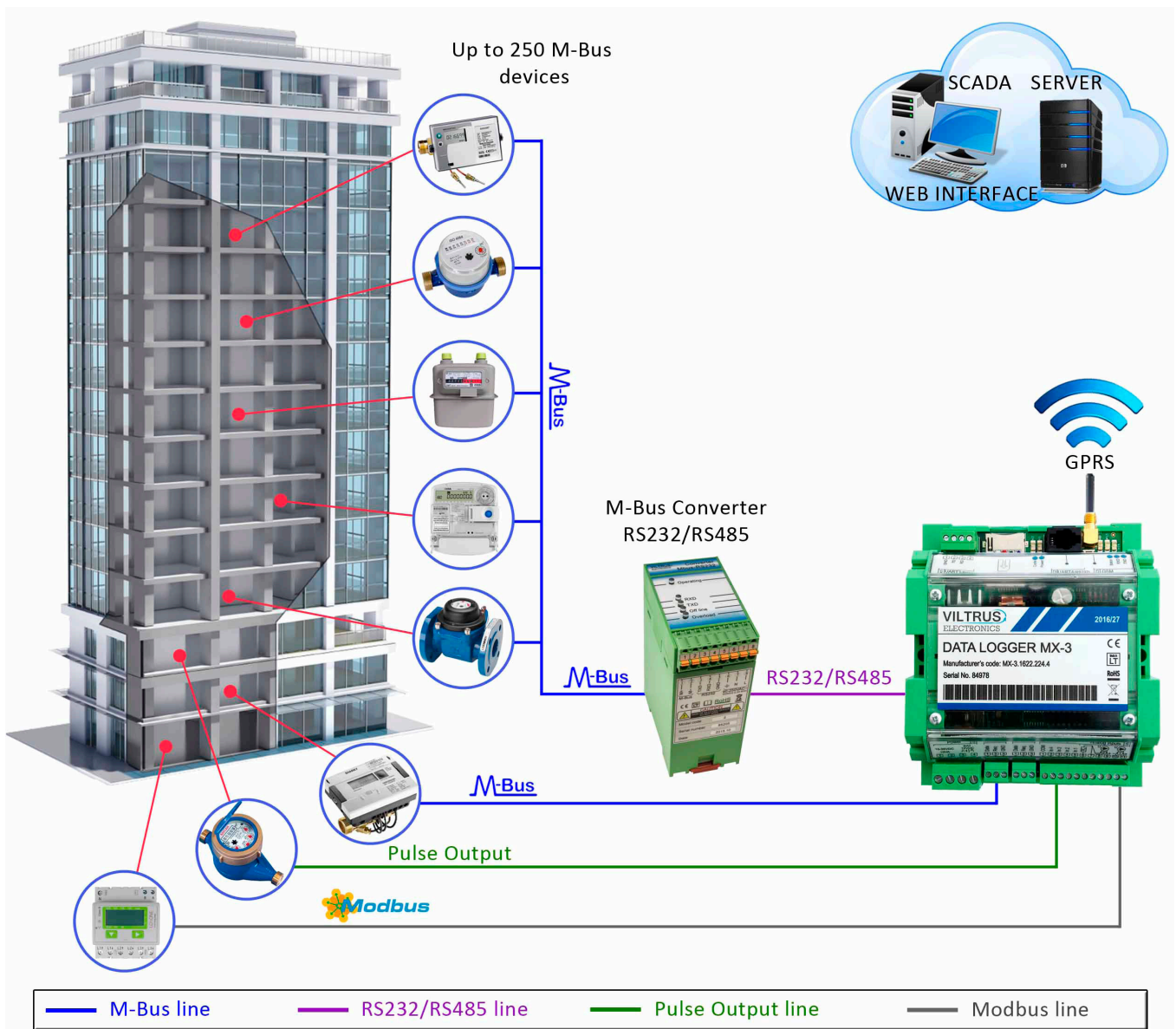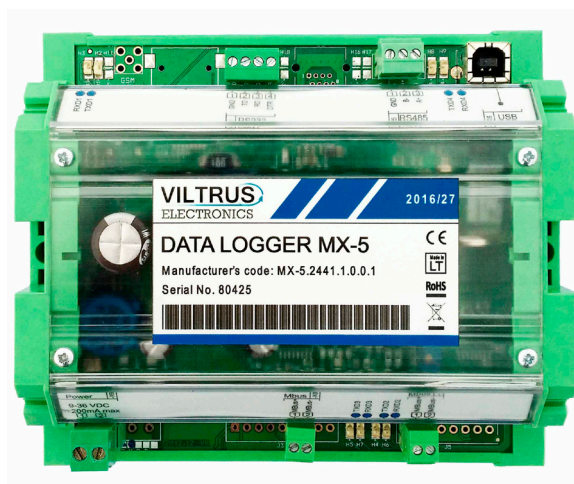
MX-5 data logger/gateway is suitable for data acquisition from any kind of meters using standard protocols. Our R&D department also can adjust our device to read meters via non-standard protocols.

MX-5 can read Kamstrup, Sensus, Diehl, Danfoss, Itron, Landis & Gyr, Apator and other meters (like exotic meters, industrial meters).

RS232	RS485	M-Bus	Data/Req
USB	GSM/GPRS	Ethernet	Current Loop

MX-5 Data Logger Application

Up to 250 M-Bus devices

SCADA   SERVER

WEB INTERFACE

GPRS

M-Bus Converter RS232/RS485

RS232 RS485

RS232/RS485

Up to 250 M-Bus devices

Modbus

Data Logger MX-5

VILTRUS ELECTRONICS
DATA LOGGER MX-5
Manufacturer's code: MX-5.2441.1.0.0.1
Serial No. 80425

—— M-Bus line   —— RS232/RS485 line   —— Modbus line

VILTRUS
ELECTRONICS
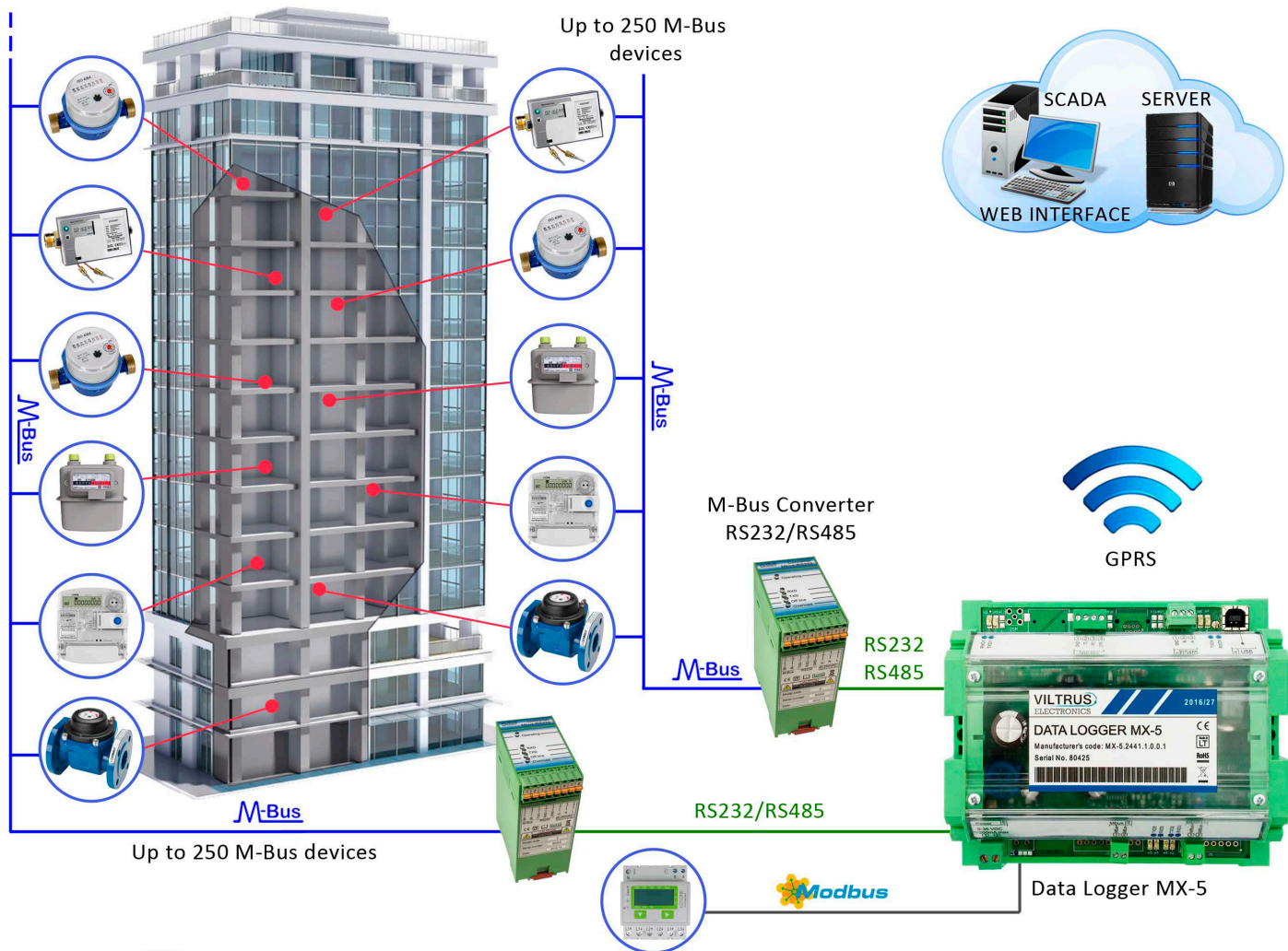
MX-9 Wireless M-Bus Data Logger 433MHz/868MHz

MX-9 data logger is dedicated for collecting the data via Wireless M-Bus and real time logging, analyzing of data. Using GPRS/GSM or Ethernet, logger sends data to remote users / server. MX-9 can also communicate with other controllers and sensors. Device has wide range of optional interfaces and protocols and can read any kind of meters, controllers and sensors equipped with standard protocols. Perfect for telemetry/monitoring, control and smart metering.

FEATURES

- Reading data from meters (heat, water, gas, electricity...), sensors and controllers
- Independent data log with real time stamp (Real Time Clock)
- Supported interfaces: Wireless M-Bus, M-Bus, RS232, RS485, Current Loop, Data/Req, USB, GSM/GPRS, Ethernet
- Wireless M-Bus supports:
  - » S, T, R, C modes (433 MHz/868 MHz)
  - » OMS (Open metering system)
  - » up to 300 Wireless M-Bus devices
- Remote communication over GSM/GPRS or Ethernet (RJ45)
- Galvanically isolated interfaces and power supply
- Power supply for external powering of meters

TECHNICAL DATA

Interfaces

Interfaces	
RS232 (4 ports)	up to 15m, speed up to 57600 bit/s
RS485 (3 ports)	distance up to 1,2 km, max 32 transivers, speed up to 57600 bit/s
Data/Req (2 ports)	(Kamstrup) data transfer interface
M-Bus (2 ports)	up to 16 M-Bus devices (up to 8 per port)
WM-Bus	up to 300 Wireless M-Bus devices. Modes S, T, R, C. Frequency 433 MHz or 868 MHz
Current Loop (2 ports)	25-27V, 14-20mA, up to 6 km, speed up to 19,2 Kbit/s
GSM/GPRS	4 band 850/900/1800/1900 MHz
Ethernet	10/100 Mbps, RJ45, distance up to 100 m
USB	type B, ver. 2,0

Protocols

Modbus RTU, Modbus TCP/IP, IP, ICMP, UDP, TCP, DHCP, PPP, ARP, SNTP, DynDNS, FTP server, FTP client, DNS client, IEC60870-5-104:2000 (IEC 104)

LED indication

Power	
Serial ports read/write for each port	
GSM/GPRS modem status	
Ethernet status	

General

General	
Power supply	9-36 VDC
Galvanic isolation	>1000V
Capacity	300mA max
Power for external devices	3,7/5/6/8/10 V (<20mA)
CPU	ARM7
External memory	up to 8 GB micro SD
Memory	archive storage up to 8 MB, data storage without power 5 years

Climate conditions

Climate conditions	
Operating temperature	-25 .. +60°C
Storage temperature	-40 .. +60°C
Humidity range	5-95%, non-condensing

Physical characteristics

Physical characteristics	
Dimensions	147x128x50
Weight	400 g
Mounting	on DIN rail
IP protection	IP20

Other features

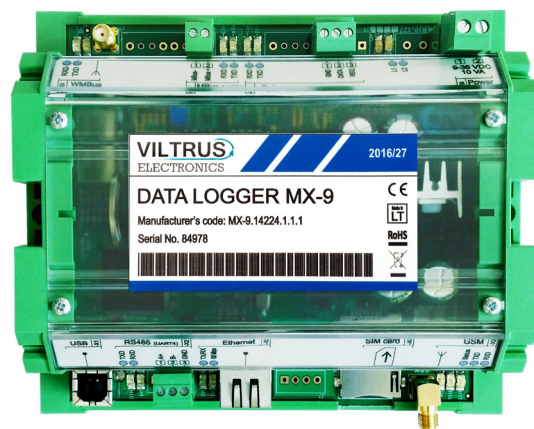| Other features	
Real time clock	
M-Bus auto setup	

MX-9 Wireless M-Bus Data Logger 433MHz/868MHz

MX-9 data logger/gateway is suitable for data acquisition from any kind of meters using Wireless M-Bus with T, S, R, C modes via OMS (open metering system). Our gateway can read meters via 868 MHz or 433 MHz frequency.

MX-9 can read all devices with Wireless M-Bus T, S, R, C modes (OMS), like SENSUS iPERL water meter, Kamstrup MULTICAL 602 heat meter and so on.

RS232	RS485	M-Bus	Data/Req
Ethernet	**GSM/GPRS**	**Current Loop**	**USB**
Wireless M-Bus	**T, S, R, C modes**	**433 MHz/868 MHz**	**OMS**

MX-9 Wireless M-Bus Data Logger Application

Up to 300 units Wireless M-Bus meters

433 MHz/868 MHz
T, S, R, C modes

SCADA   SERVER

WEB INTERFACE

GPRS

DATA LOGGER MX-9
Manufacturer's code: MX-9.14224.1.1.1
Serial No. 84978

MX-9 Wireless M-Bus Data Logger

——— M-Bus line   ——— Modbus line
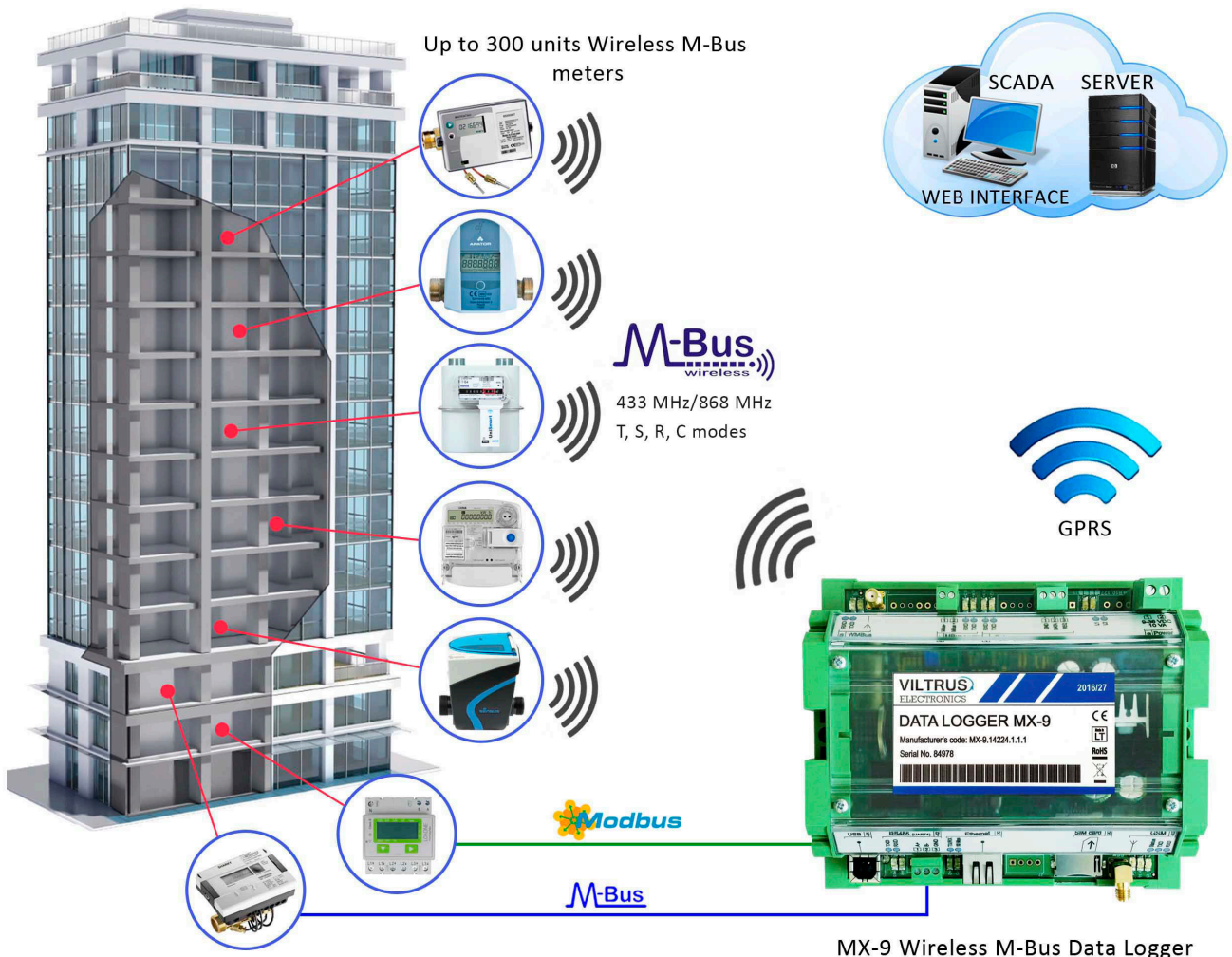
MX-4 GSM/GPRS Data Logger with analog and digital I/O

MX-4 data logger is dedicated for real time logging and analyzing of data. Using GPRS/GSM logger sends data to remote users / server. MX-4 can read any kind of meters, can also communicate with other controllers and sensors.
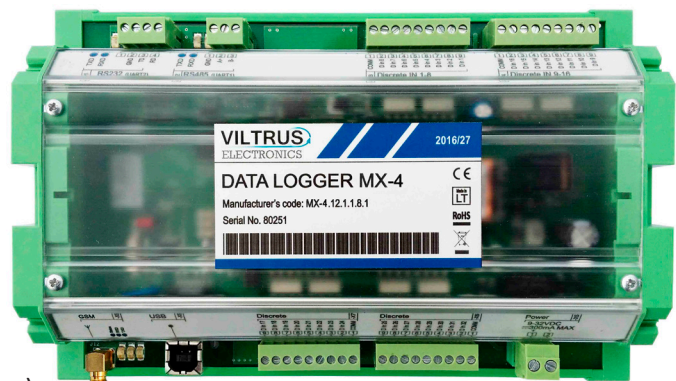
MX-4 data logger/controller can measure and store different kinds of analog inputs (current, voltage, resistance or PT100 temperature sensors), discrete inputs (alarms or events) and also it performs control capabilities over discrete outputs (remote management).

MX-4 data logger is ideal for smart metering, data acquisition, remote devices control, measure and store different kinds of analog and discrete I/O applications, process monitoring.

FEATURES

- Reading data from meters, sensors and controllers
- Independent data log with real time stamp
- Supported interfaces: M-Bus, RS232, RS485, USB, Data/Req, GSM/GPRS
- Up to 4 analog inputs (current, voltage, resistance or thermoresistor PT100/PT1000)
- Up to 8 discrete outputs
- Up to 16 discrete inputs (contact, impulse counter, alarm)
- Remote communication and updates through GSM/GPRS

TECHNICAL DATA

Overall specification	
CPU	ARM7
Flash	archive storage up to 8 MB, independent data storage without power about 5 years
Interfaces	
RS232 (3 ports)	distance up to 15 m, speed up to 19,2 Kbit/s
RS485 (3 ports)	distance up to 1,2 km, speed up to 19,2 Kbit/s
Data/Req	(Kamstrup) data transfer interface
M-Bus (1 port)	up to 8 M-Bus devices
GSM/GPRS	3 band 900/1800/1900 MHz
USB	type B, ver. 2,0
Discrete IN	16	sink contacts
Discrete OUT	8	open collector, >50VDC and >500mA
Analog IN	4	current 0/4-20mA, 0-5 mA, voltage (0-5V, 0-10V), resistance or thermoresistor PT100 or PT1000
Physical characteristics	
Dimensions	197x128x50 mm
Mounting	on DIN rail
Programming and updating	
Remote	GSM/GPRS
Locally	USB, RS232 or RS485

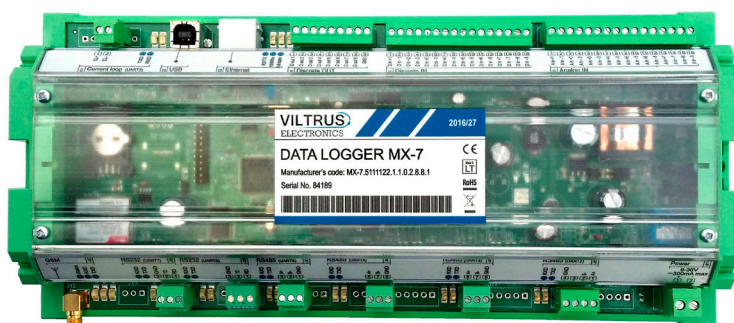| General	
Power supply	9-36 VDC / 10VA
Galvanic isolation	>1000V
Power consumption	<10VA
Capacity	300mA max
Climate conditions	
Operating temperature	-25 .. +60ºC
Storage temperature	-40 .. +60ºC
Humidity range	5-95%, non-condensing
Protocols	
Modbus RTU, Modbus TCP/IP, IP, ICMP, UDP, TCP, DHCP, PPP, ARP, SNTP, DynDNS, FTP server, FTP client, DNS client, IEC60870-5-104:2000 (IEC 104)	
LED indication	
Power	
Status of discrete input, for each port	
Serial ports read/write for each port	
GSM/GPRS modem status	
Other features	
Real time clock	
M-Bus auto setup	
24 months warranty period	

MX-7 Universal GPRS/Ethernet Data Logger

MX-7 data logger is dedicated for real time logging and analyzing of data. Using GPRS/GSM or Ethernet, logger sends data to remote users/server. MX-7 can also communicate with other controllers and sensors. Device has wide range of optional interfaces and protocols (Modbus RTU, Modbus TCP/IP, IEC60870-5-104: 2000, etc.) and can read any kind of meters, controllers and sensors equipped with standard protocols.

MX-7 can also measure and store different kinds of discrete inputs (limit switches, alarms, push buttons, relay contacts...), discrete outputs (remote management) and analog inputs (current/voltage).

MX-7 data logger is ideal for smart metering, telemetry, data acquisition, remote devices control, measure and store different kinds of analog and discrete I/O applications, process monitoring.

FEATURES

- Reading data from meters (water, electricity, gas and others), sensors, controllers
- Independent data log with real time stamp
- Two universal (jumper switchable) interfaces
- Galvanically isolated interfaces and power supply
- Power supply for external powering of meters
- Memory expansion: up to 8GB using micro SD card

TECHNICAL DATA

Interfaces		
RS232 (8 ports)	distance up to 15 m, speed up to 19,2Kbit/s	
RS485 (7 ports)	distance up to 1,2 km, max 32 transivers, speed up to 19,2 Kbit/s	
Data/Req	(Kamstrup) data transfer interface	
M-Bus (2 ports)	up to 16 M-Bus devices	
GSM/GPRS	4 band 850/900/1800/1900 MHz	
USB	type B, ver. 2,0	
Current Loop (1 port)	25-27V, 14-20mA, up to 6 km, speed up to 19,2 Kbit/s	
Ethernet	10/100 Mbps, RJ45, distance up to 100m	
Discrete IN	8	sink contacts
Discrete OUT	8	open collector, >50VDC and >500mA
Analog IN	8	current 0/4-20mA or 0-5mA

Protocols
Modbus RTU, Modbus TCP/IP, IP, ICMP, UDP, TCP, DHCP, PPP, ARP, SNTP, DynDNS, FTP server, FTP client, DNS client, IEC60870-5-104:2000 (IEC 104)

LED indication
Power
Status of discrete input, for each port
Serial ports read/write for each port
GSM/GPRS modem status
Ethernet status

General	
Power supply	9-36 VDC
Galvanic isolation	>1000V
Capacity	300 mA max
Power for external devices	3,7/5/6/8/10 VDC (20mA)
CPU	ARM7
SD card support	micro SD card up to 8 GB
Memory	archive storage up to 8 MB, independent data storage without power about 5 years

Climate conditions	
Operating temperature	-25 .. +60°C
Storage temperature	-40 .. +60°C
Humidity range	5-95%, non-condensing

Physical characteristics	
Dimensions	277x128x50 mm
Weight	600 g
Mounting	on DIN rail
IP protection	IP20

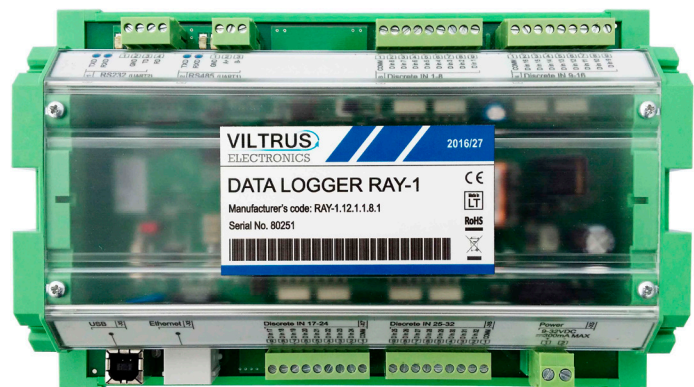| Other features |
|---|
| Real time clock |
| M-Bus auto setup |
| 24 months warranty period |

RAY-1 Ethernet Modbus Data Logger *with digital inputs*

RAY-1 data logger is designed for data logging and analyzing different kinds of discrete signals (from energy/water meters, push buttons, selector/ limit switches or relay contacts) in a real time. Data logger supports RS232, RS485, Ethernet, USB interfaces and up to 32 discrete inputs channels and can be used as stand-alone device or as extension module (Modbus slave). It can be connected to any of our data loggers/gateways like MX-7, MX-5, or it can be connected to any third party gateways.

Using Ethernet, RAY-1 sends saved data to remote users via Modbus TCP/IP protocol.

FEATURES

- RAY-1 data logger can be used as stand-alone or as expansion module for MX-7, MX-5 and other Viltrus data loggers/gateways, or it can be used with any third party gateways.
- Independent data log with real time stamp
- Supported interfaces: Ethernet, RS232, RS485, USB
- Up to 32 discrete input ports
- Remote communication over Ethernet
- Supported protocols: Modbus RTU, Modbus TCP/IP, IEC60870-5-104:2000 (IEC 104) and others
- Galvanically isolated interfaces and power supply

TECHNICAL DATA

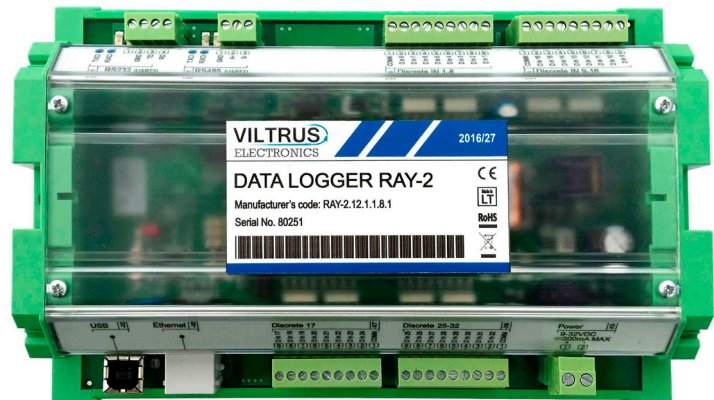| Interfaces		General	
RS232 (2 ports)	distance up to 15 m, speed up to 19,2Kbit/s	Power supply	9-36 VDC
RS485 (1 port)	distance up to 1,2 km, max 32 transivers, speed up to 19,2 Kbit/s	Galvanic isolation	>1000V
		Capacity	300mA max
USB (1 port)	type B, ver. 2,0	CPU	ARM7
Ethernet	twisted pair, 10/100 Mbps, RJ45, distance up to 100 m	Memory	archive storage up to 8 MB, independent data storage without power about 5 years
Discrete IN	32 (sink/contact inputs)		
Protocols		**Climate conditions**	
Modbus RTU, Modbus TCP/IP, IP, ICMP, UDP, TCP, DHCP, PPP, ARP, SNTP, IEC60870-5-104:2000 (IEC 104)		Operating temperature	-25 .. +60°C
		Storage temperature	-40 .. +60°C
LED indication		Humidity range	5-95%, non-condensing
Power		**Physical characteristics**	
Status of discrete input, for each port		Dimensions	197x128x50 mm
Serial ports read/write for each port		Weight	400 g
Ethernet status		IP protection	IP20
Programing and updating		**Other features**	
Remote	Ethernet (RJ45)	Real time clock	
Locally	USB, RS232 or RS485	24 months warranty period	

RAY-2 GPRS/Ethernet Data Logger with digital I/O

RAY-2 data logger is dedicated for measuring and logging different kinds of discrete signals, tracking the status of discrete inputs, count of inputs impulses, control devices (discrete outputs control) formation of discrete output signals, archiving and sending data to local operator over RS232/RS485 or USB and to remote operator over GSM/GPRS or Ethernet.

FEATURES

- Independent data log with real time stamp
- Supported interfaces: RS232, RS485, Ethernet, GSM/GPRS, USB
- Up to 16 discrete inputs (contact/impulse)
- Up to 32 discrete outputs (voltage, current)
- Data from local device reading over USB or RS232/RS485 (using Modbus RTU protocol)
- Remote data sending over GSM/GPRS or Ethernet using Modbus TCP/IP protocol
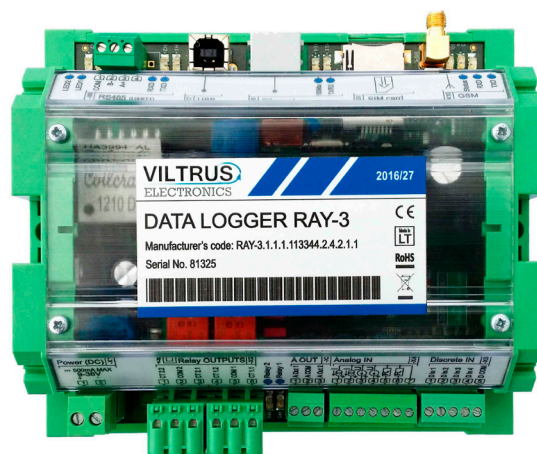
TECHNICAL DATA

Interfaces	
RS232 (2 ports)	distance up to 15 m, speed up to 19,2Kbit/s
RS485 (1 port)	distance up to 1,2 km, max 32 transivers, speed up to 19,2 Kbit/s
USB	type B, ver. 2,0
Ethernet	twisted pair, 10/100 Mbps, RJ45, distance up to 100 m
GSM/GPRS	3 band 900/1800/1900 MHz
Discrete IN	16	dry contact or potential
Discrete OUT	32	control voltage -24V, current -0,1A

Protocols
Modbus RTU, Modbus TCP/IP, IP, ICMP, UDP, TCP, DHCP, PPP, ARP, SNTP, IEC60870-5-104:2000 (IEC 104)

LED indication
Power
Discrete signal status for all ports
Serial port read/write for each port
Ethernet status
GSM/GPRS modem status

Programing and updating	
Remote	Ethernet (RJ45) or GSM/GPRS
Locally	USB, RS232 or RS485

General	
Power supply	9-36 VDC
Galvanic isolation	>1000V
Power consumption	<10VA
Interface galvanic isolation	1000V
CPU	ARM Cortex M3
Memory	archive storage up to 8 MB, independent data storage without power about 5 years

Climate conditions	
Operating temperature	-25 .. +60°C
Storage temperature	-40 .. +60°C
Humidity range	5-95%, non-condensing

Physical characteristics	
Dimensions	238x128x50 mm
Weight	800 g
Mounting	on DIN rail
IP protection	IP20

Other features
Real time clock
24 months warranty period

RAY-3 Modbus 3G Data Logger with analog and digital I/O

RAY-3 data logger is dedicated for measuring of analog (voltage, current, resistance) parameters, for tracking the status of discrete inputs, formation of discrete output signals, archiving and sending data to local users/server over RS232 or RS485 and to remote users/server over Ethernet or 3G (UMTS/HSPA+) using Modbus TCP/IP protocol.

FEATURES

- Reading data from meters (heat, water, gas, electricity), sensors, controllers
- Independent data log with real time stamp (Real Time Clock)
- Supported interfaces: M-Bus, RS232, RS485, USB, 3G, Ethernet
- Up to 6 analog inputs (voltage, current, resistance)
- Up to 2 analog outputs (voltage 0-10V)
- Up to 4 discrete inputs (contact, impulse counter, alarm)
- Up to 2 relay outputs (230Vac, 3A)
- SMS sending for alarm events
- Remote data sending over Ethernet or 3G (UMTS/HSPA+) using Modbus TCP/IP protocol
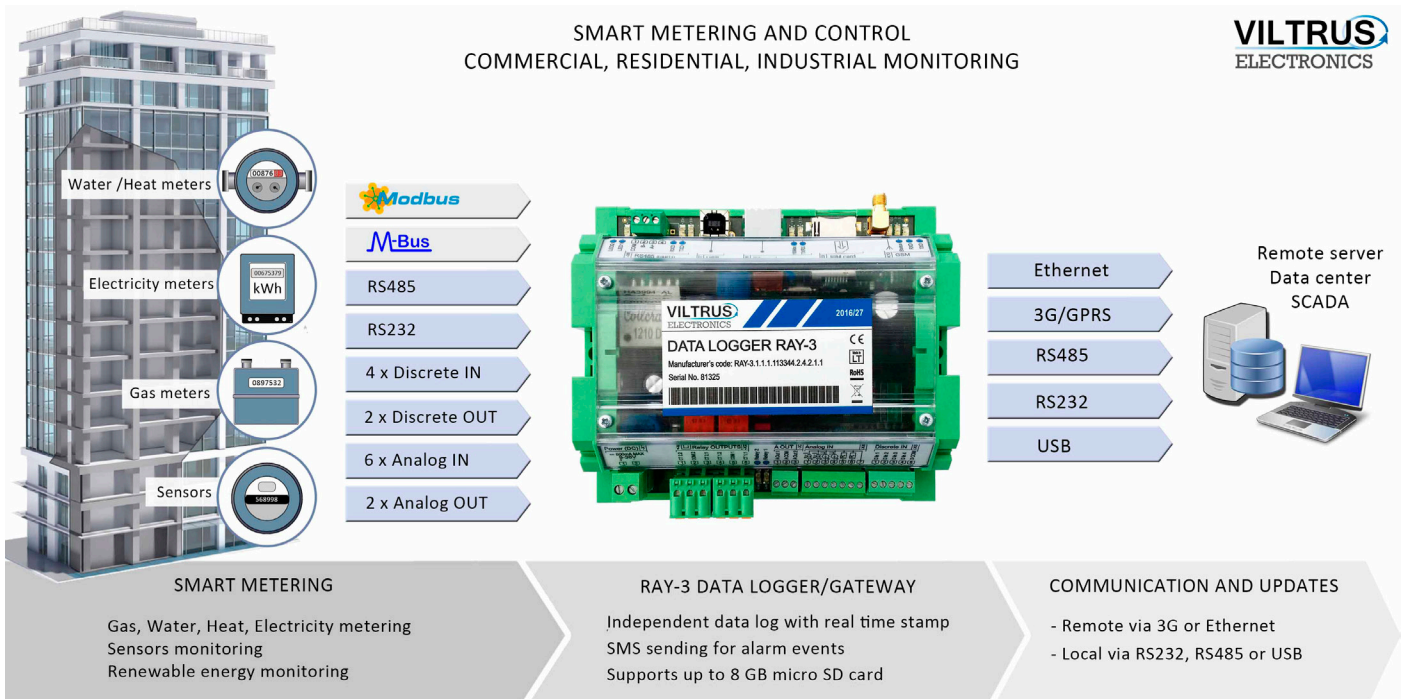
TECHNICAL DATA

Interfaces		
RS232 (2 ports)	up to 15 m, speed up to 57600 bit/s	
RS485 (1 port)	distance up to 1,2 km, max 32 transivers, speed up to 57600 bit/s	
M-Bus (1 port)	up to 8 M-Bus devices	
3G (UMTS/HSPA+)	2 band, depending on market 850/1900 MHz, 900/2100 or 800(850)/2100 MHz	
Ethernet	10/100 Mbps, RJ45, distance up to 100m	
Discrete IN	4	sink contacts
Discrete OUT	2	relay 3A
Analog IN	6	voltage 0-10V, current 0/4-20mA, resistance, PT100/PT1000
Analog OUT	2	voltage 0-10V, load up to 5mA

Protocols
Modbus RTU, Modbus TCP/IP, IP, ICMP, UDP, TCP, DHCP, PPP, ARP, SNTP, DynDNS, FTP server, FTP client, DNS client, IEC60870-5-104:2000 (IEC 104), MQTT

LED indication
Power
Charging of internal battery
Status of discrete input, for each port
Serial ports read/write for each port
GSM/GPRS status
Ethernet status
Ethernet status

General	
Power supply	9-36 VDC
Galvanic isolation	>1000V
Power consumption	500mA max
Internal battery	3,7V 750 mAh
SD card support	micro SD card up to 8 GB
CPU	CORTEX M4
Memory	archive storage up to 8 MB, independent data storage without power about 5 years

Climate conditions	
Operating temperature	-25 .. +60°C
Storage temperature	-40 .. +60°C
Humidity range	5-95%, non-condensing

Physical characteristics	
Dimensions	147x128x50 mm
Weight	400 g
Mounting	on DIN rail
IP protection	IP20

Programing and updating	
Remote	3G or Ethernet
Locally	USB, RS232 or RS485

Other features
Real time clock
24 months warranty period

RAY-3 Modbus 3G Data Logger with analog and digital I/O

RAY-3 data logger can read data from M-Bus, Modbus devices/meters (heat, water, gas, electricity), can also communicate with other controllers and sensors.

RAY-3 is perfect for telemetry/monitoring, control and smart metering.

RAY-3 Data Logger Possibilities

SMART METERING AND CONTROL
COMMERCIAL, RESIDENTIAL, INDUSTRIAL MONITORING

VILTRUS ELECTRONICS

Water /Heat meters

Electricity meters

Gas meters

Sensors

Modbus
M-Bus
RS485
RS232
4 x Discrete IN
2 x Discrete OUT
6 x Analog IN
2 x Analog OUT

DATA LOGGER RAY-3
Manufacturer's code: RAY-3.1.1.1.113344.2.4.2.1.1
Serial No. 81325

Ethernet
3G/GPRS
RS485
RS232
USB

Remote server
Data center
SCADA

SMART METERING	RAY-3 DATA LOGGER/GATEWAY	COMMUNICATION AND UPDATES
Gas, Water, Heat, Electricity metering Sensors monitoring Renewable energy monitoring	Independent data log with real time stamp SMS sending for alarm events Supports up to 8 GB micro SD card	- Remote via 3G or Ethernet - Local via RS232, RS485 or USB

RAY-3 Data Logger Application Example

Up to 250 M-Bus devices

VILTRUS ELECTRONICS

M-Bus

M-Bus converter
RS232/RS485

RS232/
RS485

M-Bus

RS232/485

Up to 250 M-Bus devices

3G/GPRS

DATA LOGGER RAY-3
Manufacturer's code: RAY-3.1.1.1.113344.2.4.2.1.1
Serial No. 81325

UTILITY, BILLING
COMPANIES

SMART METERING
Remote server, Data center
SCADA
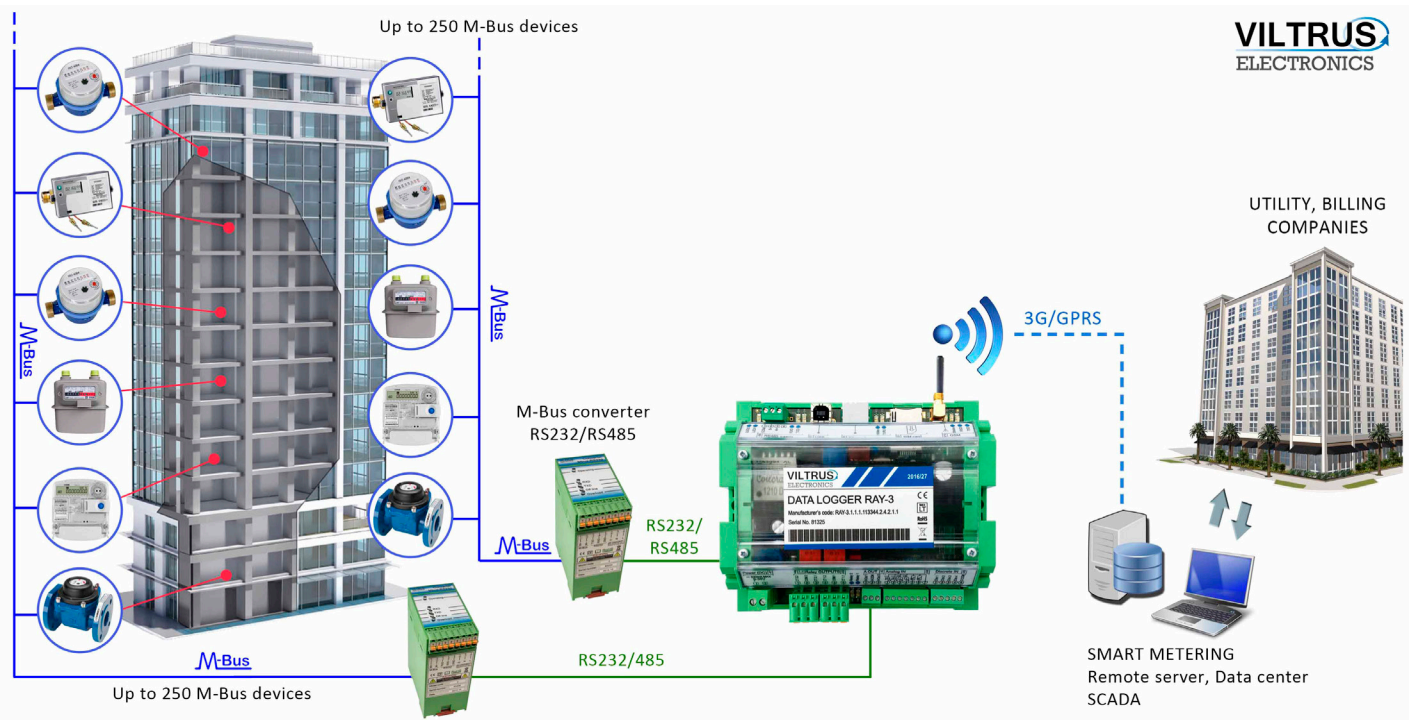
RAY-4 Ethernet Data Logger with analog IN and digital I/O

RAY-4 data logger is dedicated for measuring of analog (voltage, current) parameters, for tracking the status of discrete inputs, formation of discrete output signals, archiving and sending data to local operator over RS232/RS485 or USB and to remote operator over Ethernet.

FEATURES

- Independent data log with real time stamp (Real Time Clock)
- Supported interfaces: RS232, RS485, USB, Ethernet, Analog IN, Discrete IN/OUT
- Up to 2 analog inputs (voltage, current)
- Up to 8 discrete inputs (contact / impulse)
- Up to 8 discrete relay outputs
- Supported protocols: Modbus RTU, Modbus TCP/IP, SNTP, IEC60870-5-104:2000 and others
- Data from local device reading over USB or RS232/RS485 (using Modbus RTU protocol)
- Remote data sending over Ethernet using Modbus TCP/IP protocol

TECHNICAL DATA

Interfaces		
RS232 (1 port)		distance up to 15 m, speed up to 19,2Kbit/s
RS485 (1 port)		distance up to 1,2 km, max 32 transivers, speed up to 19,2 Kbit/s
USB		type B, ver. 2,0
Ethernet		twisted pair, 10/100 Mbps, RJ45, distance up to 100 m
Discrete IN	8	dry contact or potential
Discrete OUT	8	relay (220V/3A AC or 24V/1A DC)
Analog IN	2	voltage or current, reading 10 times per second

Protocols
Modbus RTU, Modbus TCP/IP, IP, ICMP, UDP, TCP, DHCP, PPP, ARP, SNTP, IEC60870-5-104:2000 (IEC 104)

LED indication
Power
Discrete signal status for all ports
Serial port read/write for each port
Ethernet status

Programing and updating	
Remote	Ethernet
Locally	USB, RS232 or RS485

General	
Power supply	30-80VDC
Galvanic isolation	>1000V
Power consumption	up to 9W
Power for external devices	5V (<500mA) or 12 V(<200mA)
CPU	ARM Cortex M3
Memory	archive storage up to 8 MB, independent data storage without power about 5 years

Climate conditions	
Operating temperature	-25 .. +60°C
Storage temperature	-40 .. +60°C
Humidity range	5-95%, non-condensing

Physical characteristics	
Dimensions	107x128x50 mm
Weight	300 g
Mounting	on DIN rail
IP protection	IP20

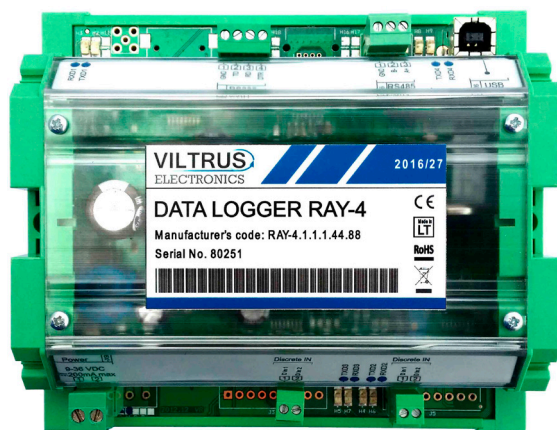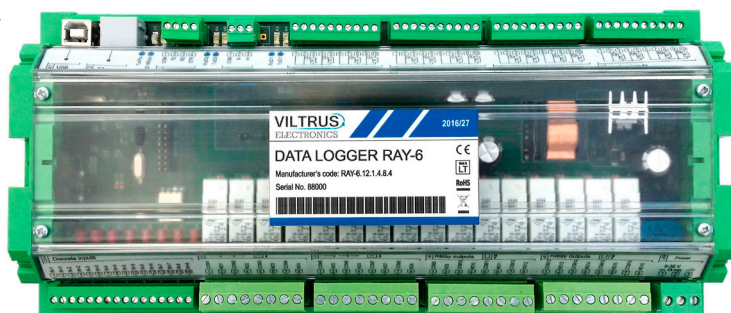| Other features |
|---|
| Real time clock |
| 24 months warranty period |

RAY-6 Modbus Data Logger with analog and digital I/O

RAY-6 data logger is dedicated for measuring of analog (voltage, current, resistance) parameters, for tracking the status of discrete inputs, formation of discrete output signals, archiving and sending data to local users/server over RS232/RS485 or USB and to remote users/server over Ethernet using Modbus TCP/IP protocol.

FEATURES

- Reading data from meters (heat, water, gas, electricity), sensors, controllers
- Independent data log with real time stamp
- Supported interfaces: RS232, RS485, USB, Ethernet
- Up to 16 analog inputs (voltage, current, resistance, PT100/PT1000)
- Up to 8 discrete inputs (contact / impulse / alarm)
- Up to 16 relay outputs
- SMS sending for alarm events
- Remote data sending over Ethernet or using Modbus TCP/IP protocol

TECHNICAL DATA

Interfaces		
RS232 (2 ports)	distance up to 15 m, speed up to 19,2Kbit/s	
RS485 (2 ports)	distance up to 1,2 km, max 32 transivers, speed up to 19,2 Kbit/s	
Ethernet	10/100 Mbps, RJ45, distance up to 100m	
USB	type B, ver. 2,0	
Discrete IN	8	sink contacts
Discrete OUT	16	relay (220VDC/3A; 24VAC/1A)
Analog IN	16	current 0/4-20mA voltage 0-10V PT100/PT1000

Protocols
Modbus RTU, Modbus TCP/IP, IP, ICMP, UDP, TCP, DHCP, PPP, ARP, SNTP, DynDNS, FTP server, FTP client, DNS client, IEC60870-5-104:2000 (IEC 104)

LED indication
Power
Status of discrete input, for each port
Serial ports read/write for each port
Ethernet status

General	
Power supply	9-36 VDC
Galvanic isolation	>1000V
Power consumption	<10VA
CPU	CORTEX M4
Memory	archive storage up to 8 MB, independent data storage without power about 5 years

Climate conditions	
Operating temperature	-25 .. +60°C
Storage temperature	-40 .. +60°C
Humidity range	5-95%, non-condensing

Physical characteristics	
Dimensions	277x128x50 mm
Weight	800 g
Mounting	on DIN rail
IP protection	IP20

Other features
Real time clock
24 months warranty period

RAY-8 Ethernet Data Logger with analog IN

RAY-8 data logger is designed for data logging and analyzing of analog signals in a real time. Data logger supports RS232, RS485, Ethernet, USB interfaces and up to 8 analog inputs channels (current, voltage and resistance inputs) and can be used as standalone device or as extension module. It can be connected to any of our data loggers like MX-7 or MX-5.

Using Ethernet, RAY-8 sends saved data to remote users over Modbus TCP/IP protocol.

FEATURES

- Independent data log with real time stamp
- Supported interfaces: Ethernet, RS232, RS485, USB
- Up to 8 analog inputs (current, voltage or resistance)
- Remote communication over Ethernet (RJ45, 10/100Mbps)
- Supported protocols: Modbus RTU, Modbus TCP/IP, SNTP, IEC60870-5-104:2000, FTP server/client and others
- Galvanically isolated interfaces and power supply
- Power supply: 9-36 VDC
- Mounting type: on DIN rail

TECHNICAL DATA

Interfaces	
RS232	distance up to 15 m, speed up to 19,2Kbit/s
RS485	distance up to 1,2 km, max 32 transivers, speed up to 19,2 Kbit/s
USB	type B, ver. 2,0
Ethernet	twisted pair, 10/100 Mbps, RJ45, distance up to 100 m
Up to 8 Analog IN	current 0-20 mA/4-20mA/0-5mA, voltage 0-5 V, 0-10 V, resistance or thermoresistor PT100

Protocols
Modbus RTU, Modbus TCP/IP, IP, DynDNS, SNTP, FTP server, FTP client, DNS client, IEC60870-5-104:2000 (IEC 104)

LED indication
Power
Serial ports read/write for each port
Ethernet status

Programing and updating	
Remote	Ethernet (RJ45)
Locally	USB, RS232 or RS485

General	
Power supply	9-36 VDC
Galvanic isolation	>1000V
Capacity	200mA max
CPU	ARM7
Memory	archive storage up to 8 MB, independent data storage without power about 5 years

Climate conditions	
Operating temperature	-25 .. +60°C
Storage temperature	-40 .. +60°C
Humidity range	5-95%, non-condensing

Physical characteristics	
Dimensions	120x101x35 mm
Weight	170 g
Mounting	on DIN rail
IP protection	IP20

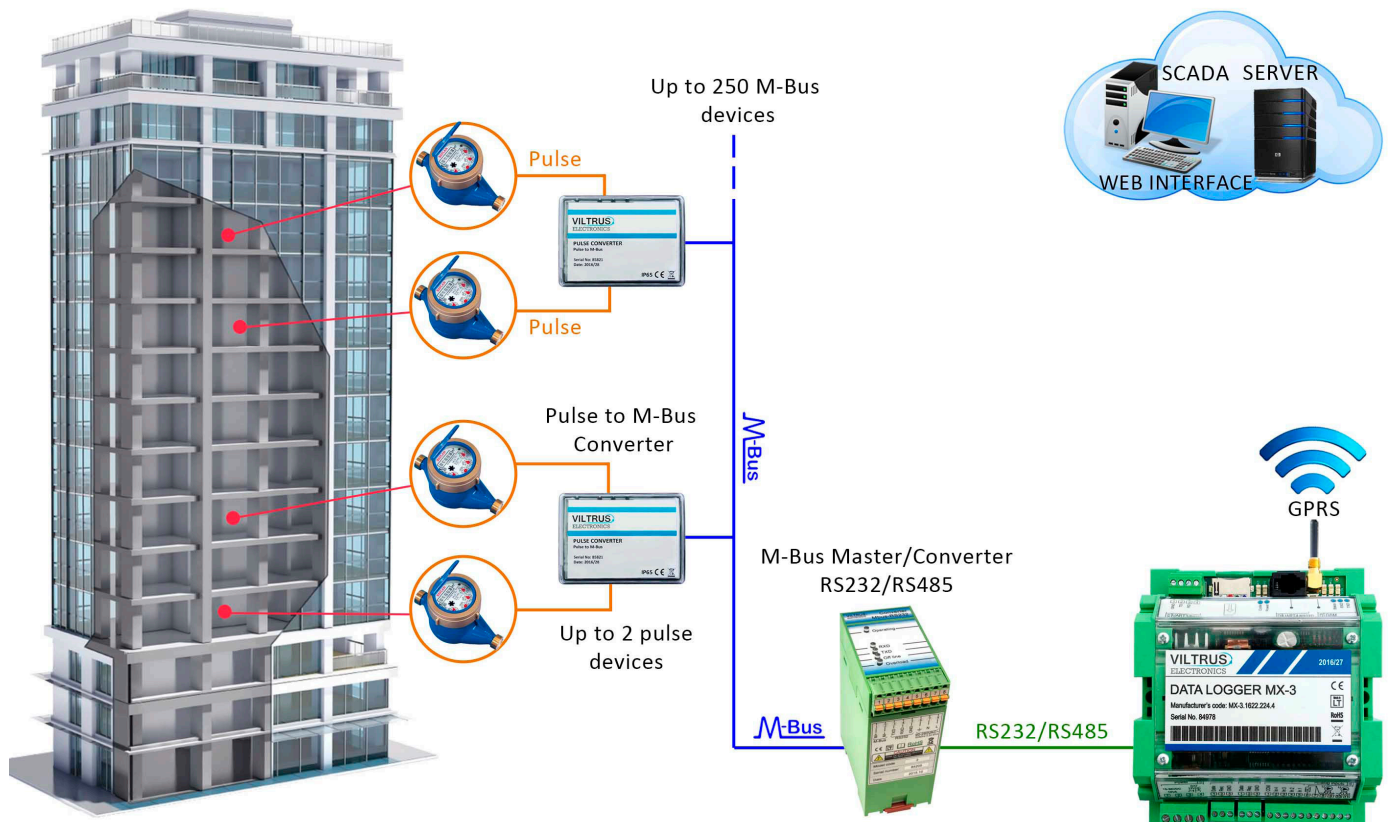| Other features |
|---|
| Real time clock |
| 24 months warranty period |

Pulse to M-Bus Converter

Pulse to M-Bus Converter reading data from pulse meters (heat, water, gas, electricity, etc.). Up to 2 pulse meters can be connected to the Pulse Converter.

FEATURES

- Pulse conversion to standard M-Bus
- Can be connected up to 2 pulse meters
- Pulse cable can't exceed 10 m
- Max pulse frequency: 16 Hz
- Pulse min. width: 30 ms
- Internal lithium battery 3,6V (life 12 years)
- Mounting type: on DIN rail or on the wall
- Dimensions: 117x90x44 mm
- Weight: 300 g
- Protection type: IP65
- Operating temperature: 0 to +55°C
- Storage temperature: -25 to +60°C
- Safety class: III by EN60950

Pulse to M-Bus Converter Application

Up to 250 M-Bus devices

Pulse

Pulse

Pulse to M-Bus Converter

Up to 2 pulse devices

M-Bus

SCADA SERVER

WEB INTERFACE

GPRS

M-Bus Master/Converter RS232/RS485

M-Bus

RS232/RS485

----- M-Bus line   ----- RS232/RS485 line   ----- Pulse Output line

VILTRUS MX/RAY Data Loggers Overview

MX and RAY data loggers, gateways, data concentrators and controllers have a wide range of different interfaces (RS232, RS485, M-Bus, Wireless M-Bus, Data/Req, Current loop, USB, Ethernet, GSM/GPRS), analog/discrete inputs and outputs. For easiest way to choose JSC "VILTRUS" data loggers/gateways or control units we present our product comparison/overview table.

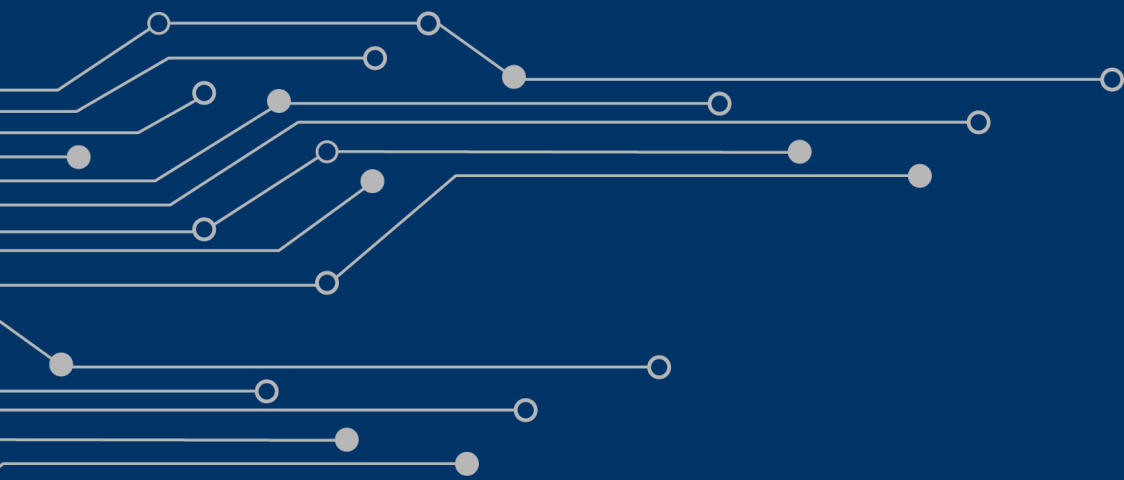| Model	IN/OUT ports				Communication interfaces									System				Power supply		
	Analog (IN)	Analog (OUT)	Discrete (IN)	Discrete (OUT)	Wireless M-Bus	M-Bus	Opto (Data/Req)	Current loop	RS232	RS485	USB	Ethernet (RJ45)	GSM/GPRS	Real time clock	Log file size (MB)	SD card socket	Distance programing	Power for ext. device	Battery charging	DC/AC
MX-1	-	-	-	-	-	1	-	-	1	1	1	-	+	+	8	+	+	-	-	50-250
MX-2	-	-	-	-	-	-	-	-	1	1	1	1	-	-	-	-	+	-	-	50-250
MX-3	3	-	4	-	-	1	1	-	2	2	1	-	+	+	8	-	+	-	+	9-36/-
MX-4	4	-	16	8	-	1	1	-	3	3	1	-	+	+	8	-	+	-	-	9-36/-
MX-5	-	-	-	-	-	2	2	2	4	3	1	1	+	+	8	+	+	+	-	9-36/-
MX-6	-	-	8	-	-	1	2	2	4	3	1	1	+	+	8	-	+	+	-	9-36/-
MX-7	8	-	8	8	-	2	2	1	8	7	1	1	+	+	8	+	+	+	-	9-36/-
MX-9	-	-	-	-	1	2	2	2	4	3	1	1	+	+	8	+	+	+	-	9-36/-
RAY-1	-	-	32	-	-	-	-	-	2	1	1	1	-	+	8	-	+	-	-	9-36/-
RAY-2	-	-	16	32	-	-	-	-	2	1	1	1	+	+	8	-	+	-	-	9-36/-
RAY-3	6	2	4	2	-	1	-	-	2	1	1	1	+	+	8	+	+	-	+	9-36/-
RAY-4	2	-	8	8	-	-	-	-	1	1	1	1	-	+	8	-	+	-	-	30-80/-
RAY-6	16	-	8	16	-	-	-	-	2	2	1	1	-	+	8	-	+	-	-	9-36/-
RAY-8	8	-	-	-	-	-	-	-	1	1	1	1	-	+	8	-	+	-	-	9-36/-

JSC "VILTRUS" company's strength is our R&D department. We can create devices and technologies in accordance of our client's or partner's needs.

JSC "VILTRUS" MX/RAY data loggers/gateways supports Modbus RTU, Modbus TCP/IP, IP, ICMP, UDP, TCP, DHCP, PPP, ARP, SNTP, IEC60870-5-104:2000, DynDNS, FTP server, FTP client, DNS client, MQTT protocols.

JSC "VILTRUS" devices can read: Kamstrup, Sensus, Diehl, Danfoss, Itron, Landis & Gyr, Apator and other meters (like exotic meters/industrial meters).

DIEHL SENSUS Kamstrup Danfoss Itron APATOR Landis|Gyr+

VILTRUS
ELECTRONICS