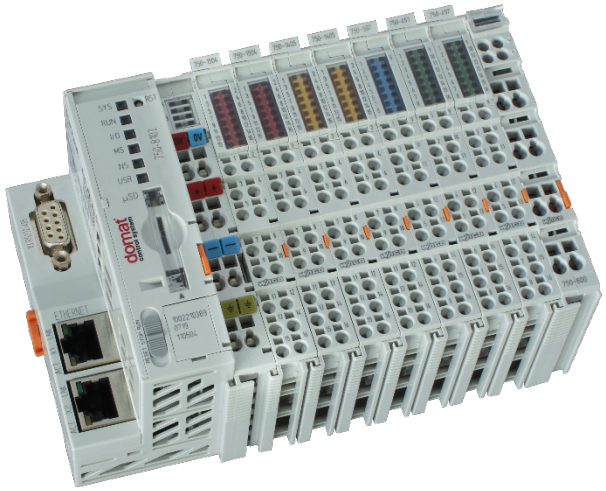
order number

wMXcom DDC controller



Summary

DDC (Direct digital control) controller wMXcom is a compact PLC with Domat RT. The controller contains two Ethernet ports and a datapoint mix of 16 AI, 32 DI, 8 AO a 32 DO. Besides network and fieldbus interfaces, the controller supports all analog, digital and special I/O modules within the 750/753 series.

Application

- **Freely programmable control units for HVAC systems and other applications with web access.**
- **Data acquisition, processing, and presentation systems with advanced networking features.**
- **Protocol converters with web data presentation (must be programmed by user).**

Function

Controller wMXcom has twin-port Ethernet interface and thanks to integrated switch it is able to create bus topology.

Typical use of the PLC is in building control systems, industry and energy management systems.

- Programmable via Domat IDE
- Direct connection of I/O modules
- 2 × Ethernet (configurable)
- Operating system Linux
- Maintenance free / Low maintenance

The application is created and uploaded in the Domat IDE development environment. The maximum application program size depends on number of physical and software data points, amount of function blocks which require more memory (e.g. time schedulers), degree of code optimisation, and number of connections the PLC has to handle.

IO modules (16 AI, 8 AO, 32 DI, 32 DO) communicate with the main unit over an internal K-bus.

The process station contains a web server for remote connection and user intervention. The web pages are created in Domat HMI editor, which is included in the package of development programs. The exported web definition is uploaded to the process station through Domat IDE.

State of inputs and outputs of each module, system status, runtime operation and power supply condition is indicated by LEDs.

Controller is to be mounted on standard DIN rail.

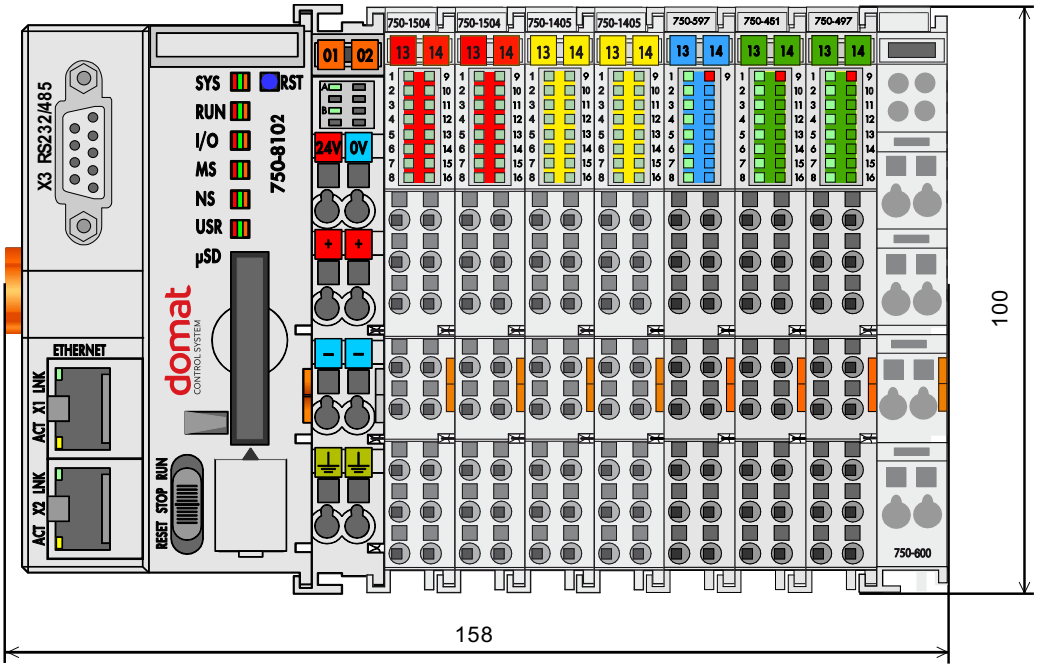
See *domat – Technical application notes* for connection examples.

Technical data

Power	24 V DC (−25…+30 %), 5.3 W, cage clamp type terminals
Operating temperature	0…55 °C
Max. admissible humidity	95 %
PLC:	
Type	750-8102
CPU	Cortex A8, 600 MHz
Memory	256 MB RAM, 64 kB NVRAM
Memory card	unsupported, not intended to be used by user
Addressing	SW or by DIP switches
Communication:	
Ethernet	2 × Ethernet 10/100, RJ45
	2 × signalling LEDs (Link, Data) part of the Ethernet connector
Programming enviroment	Domat IDE ver. 2:4:0:x or later (ST, FBD)
Terminals	cage clamp terminals - wire 0.08…2.5 mm²
Analogue inputs	**8 ×** Pt 1000, resistence 0…1200 Ohm, 0...5000 Ohm, 16 bit resolution
	(other measuring ranges, like Pt100, Ni1000 etc. can be recalculated using predefined transformations in the Merbon program)
	8 × voltage 0...10 V DC / ±10 V DC, 12 bit resolution
Analogue outputs	**8 ×** 0...10 / ±10 V DC
Load impedance	>= 2 kΩ
Digital inputs	**32 ×** 24 V DC – need to connect DC voltage, e.g. that from the power supply
Input voltage „log. 0“	max. 5 V DC, 1.6 mA
Input voltage „log. 1“	max. 30 V DC, 4.3…4.6 mA

Digital outputs	**32 ×** semiconductor, NO: 0.5 A / 24 V DC, 1 kHz
Dimensions	71.9 (h) × 158 (w) × 100 (h) mm
Weight	approx. 525 g
Protection degree	IP20
Material	polycarbonate, polyamide 6.6
Standards confirmity	electromagnetic compatibility (EMC)EN 61000-6-2, 61000-6-3 environmental testing EN 60068-2-42, 60068-2-43

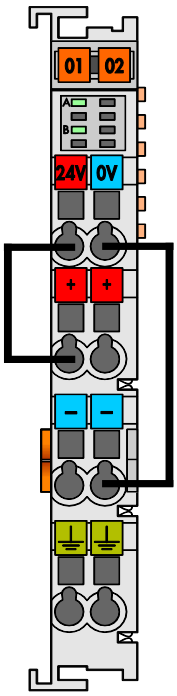
Dimensions and connection



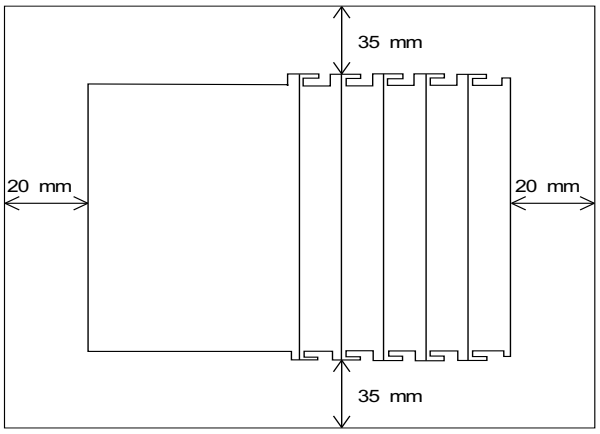
Dimensions are in *mm*.

For proper function of the controller assembly a **terminating module** 750-600 must be snapped at the end of assembly. All modules must be aligned.

To ensure power supply for the connected I/O modules, it is required to connect the **24V** and **+**, **0V** and **–** terminals on the power module (see image below).

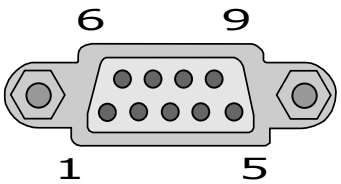


During the installation, ensure sufficient distance of controller assembly from other components:



Serial port

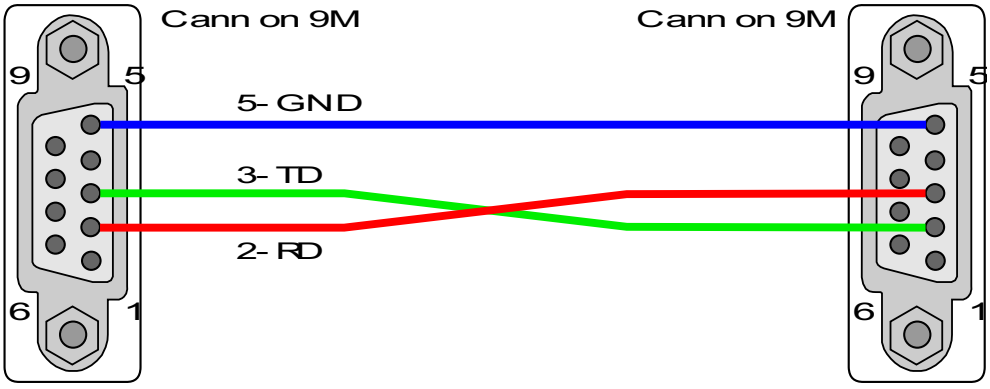
wMXcom controller has serial interface with Cannon 9F connector, which can be used as RS-232 or as RS-485. This can be set in Domat IDE.



Voltage levels for RS-232 and RS-485 are different! Ensure correct setting and connection.

Pin	RS-232		RS-485	
1	NC	Not assigned	NC	Not assigned
2	RxD (out)	Receive data	NC	Not assigned
3	TxD (in)	Transmit data	A (Tx/Rx+)	Transmit/receive data +
4	NC	Not assigned	NC	Not assigned
5	FB_GND	Ground	FB_GND	Ground
6	NC	Not assigned	FB_5V	Power supply
7	RTS (in)	Request to send	NC	Not assigned
8	CTS (out)	Clear to send	B (Tx/Rx-)	Transmit/receive data -
9	NC	Not assigned	NC	Not assigned
Enclosure	Shield	Shielding	Shield	Shielding

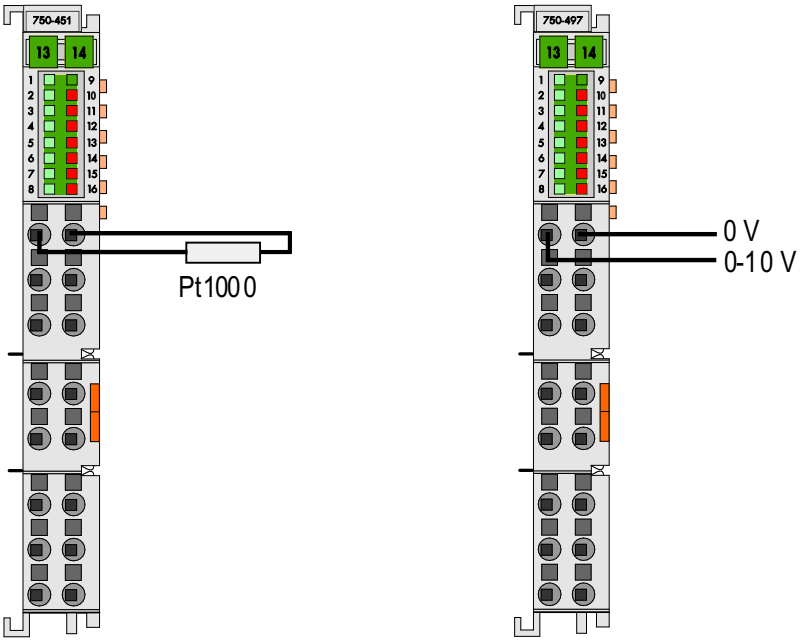
For connection of GSM modem to build-in RS232 port the null-modem M-M cable (2-3, 3-2, 5-5) should be used.



Controller is made from PLC: PFC100 (750-8102) and modules: 750-1504, 750-1405, 750-597, 750-451, 750-497 , 750-600.

Analogue inputs

Analogue input module **750-451** has fixed resistence measurement at 8 inputs.
Analogue input module **750-497** has fixed input voltage measurement (8 inputs, range 0...10 V).
See connection schemes (two-wire connection):



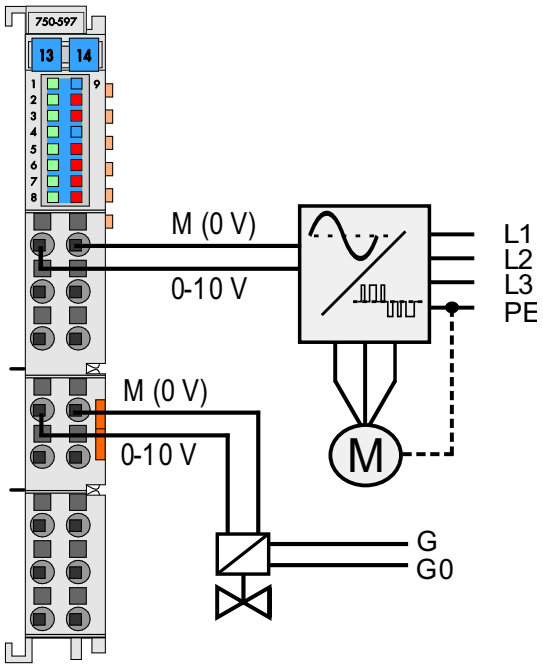
Operational readiness and trouble-free data bus communication of each input is **indicated** by green LED. For the 750-497 module, red LED indicates when measuring range is exceeded or falls below its limit for a given input. For the 750-451 module, red LED indicates wire break, short circuit or when signal is out of measuring range.

For accuracy of measurement see table in complete specification datasheet.
Complete specification of module is stated in particular datasheet:
w750-451 w750-497

Analogue outputs

Analog output module **750-597** (8 AO) provide 0...10 V DC (or ±10 V). Output signal is galvanicaly insulated and will be transmitted with a resolution of 12 bits. Measurement error is 0.1 % from the measuring range.

All outputs have common ground M (terminals 9…16), which is connected to the module minus terminal by common contact.



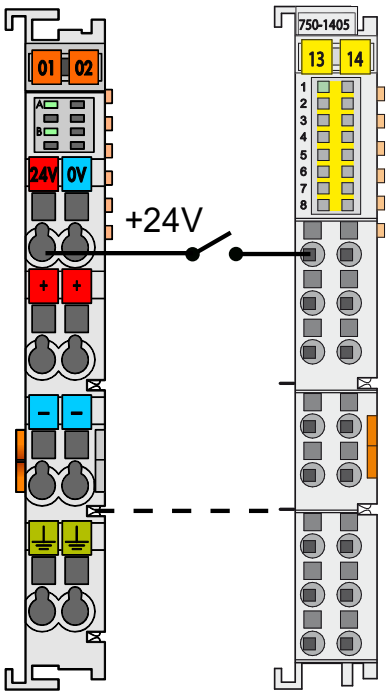
Operational readiness and trouble-free data bus communication of each channel is **indicated** by green LED. Red LED indicates status of the field power supply voltage (undervoltage or general error).

Complete specification of module is stated in particular datasheet:
w750-597

Digital inputs

Digital inputs module **750-1405** has 16 input channels (24 V DC, 3 ms). Inputs can be powered by the same power supply as wMX controller. Voltage levels are:
-3 V…+5 V for logical zero and +11 V…+30 V for logical one.

Digital inputs are connected according this schema (two-wire connection):

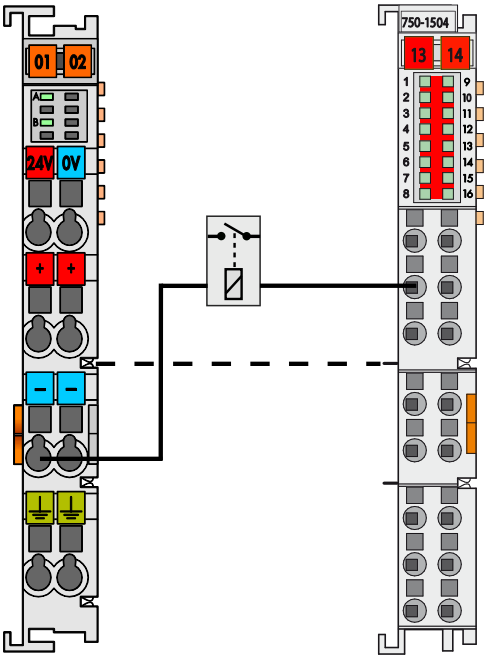


Dashed line is via PLC internal bus.
Switched state of each input is **indicated** by green LED (lit = logical one detected).

Complete specification of module is stated in particular datasheet:
w750-1405

Digital outputs

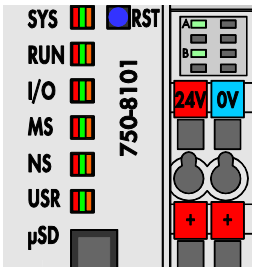
Digital outputs module **750-1504** has 16 output channels (24 V DC, 0.5 A, short-circuit protected, 1 kHz).
See scheme below for connection:



The dashed line is connected via the PLC internal bus.
Switched status of each output is indicated by the green LED in upper part of the module.

Complete specification of module is stated in particular datasheet:
w750-1504

LED indication



Red/ green/ orange LED (blink):
SYS – system status
RUN – runtime is running
I/O – bus status (not used)
MS – module status (not used)
NS – not used
USR – user programmable
green LED:
uSD – SD card status (blinks during writing on card)
A – state of supply voltage (still)
B – state of I/O modules supply voltage (still)

Switches

RST	Reset button - unused
RESET STOP RUN 	Turning this switch in RUN position, will start runtime. Turning the switch in STOP position will stop runtime. In this position is not possible to deploy and run solution. Holding switch in RESET position for 2-7 seconds will cause warm restart. Holding for time longer than 7 seconds will cause cold restart.
Address	SW address

Others

Internal Kbus addressing

For each module a position corresponding to the physical position in assembly is given to the module. E.g. first module after controller gets adress 1, etc.

Slot for SD card is for production purposes only, not intended to be used by user.

For proper function of the controller assembly a **terminating module** 750-600 must be snapped at the end of assembly. All modules must be aligned.

To ensure power supply for the connected I/O modules, it is required to connect the **24V** and **+**, **0V** and **–** terminals on the power module (see image in *Dimensions and connection*).

You can find complete specification of each device at www.wago.com.

Programming

The main programming tool is the Domat package which contains I/O editor, graphical editor of the function plan (FBD), structure text editor and compiler (Domat IDE). The Domat package contains also LCD menu editor as well as web editor (Domat HMI).

The application program consists of function blocks which are stored in libraries. Those contain analogue and digital functions, mathematical blocks including goniometric functions, time schedulers, alarm blocks, and HVAC specific blocks (heat recovery, dewpoint calculation, enthalpy, pump switch etc.). The program can be set up also as structure text (ST) or with combination of both types of programming languages.

In case of implementation of your own ST driver, there is limitation of max. 10 clients connected simultaneously.

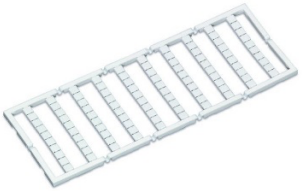
Number of connections from SSCP clients is max. 20. This includes connections from Domat IDE, Domat SCADA, HT104/200, mobile application Domat Visual, connection from other PLCs over SSCP etc.

Uploading a project from the Domat IDE reserves two SSCP TCP connections.

Accessories

Mini-WSB marking card (247-513)

- snap-on type
- horizontal markings of each module



Fieldbus connector PROFIBUS (750-960)

Safety note

The device is designed for monitoring and control of heating, ventilation, and air conditioning systems. It must not be used for protection of persons against health risks or death, as a safety element, or in applications where its failure could lead to physical or property damage or environmental damage. All risks related to device operation must be considered together with design, installation, and operation of the entire control system which the device is part of.

Cyber security note

The product may influence the information and cyber security (ICS) of the control system. It is supplied in default settings. Implementation and continuous compliance with the ICS rules (e.g. creating and upload of certificates and keys, their updates and management, protection against misuse, etc.) are fully the responsibility of the control system operator. The manufacturer is not responsible for damages which originated or may originate due of wrong or insufficient implementation of ICS rules when using the device. In case of questions, please contact Domat Control System technical support.

Changes in versions	01/2020 – First datasheet version. 12/2021 – GSM modem connection to RS232 info added. 02/2022 – Logo change, stylistic modifications, added information about limiting the number of connected clients. 03/2022 – Modified number of simultaneously connected clients using the SSCP protocol. 05/2022 – Memory size update. 08/2022 – Stylistic modifications (list of modules, order number). 04/2023 – SD card slot function specified. 04/2024 – Cyber security note added, change of names from Merbon to Domat..