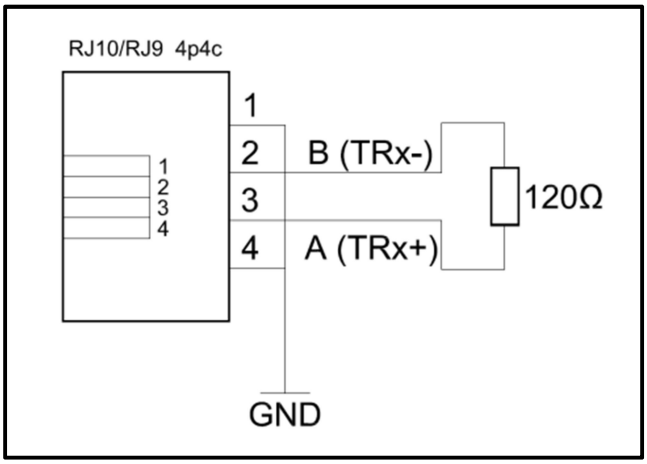
MODBUS COMMUNICATION INTERFACE - ENG

Description of the connectors: (on control panel)
- 1. PORT (RS 485) - RJ 45 (8-pin) type connector - **writing** parameters to the controller from the control system
- 2. PORT (RS 485) – RJ10/RJ9 4P4C (phone, 4-pin) type connector - listing of parameters from the controller

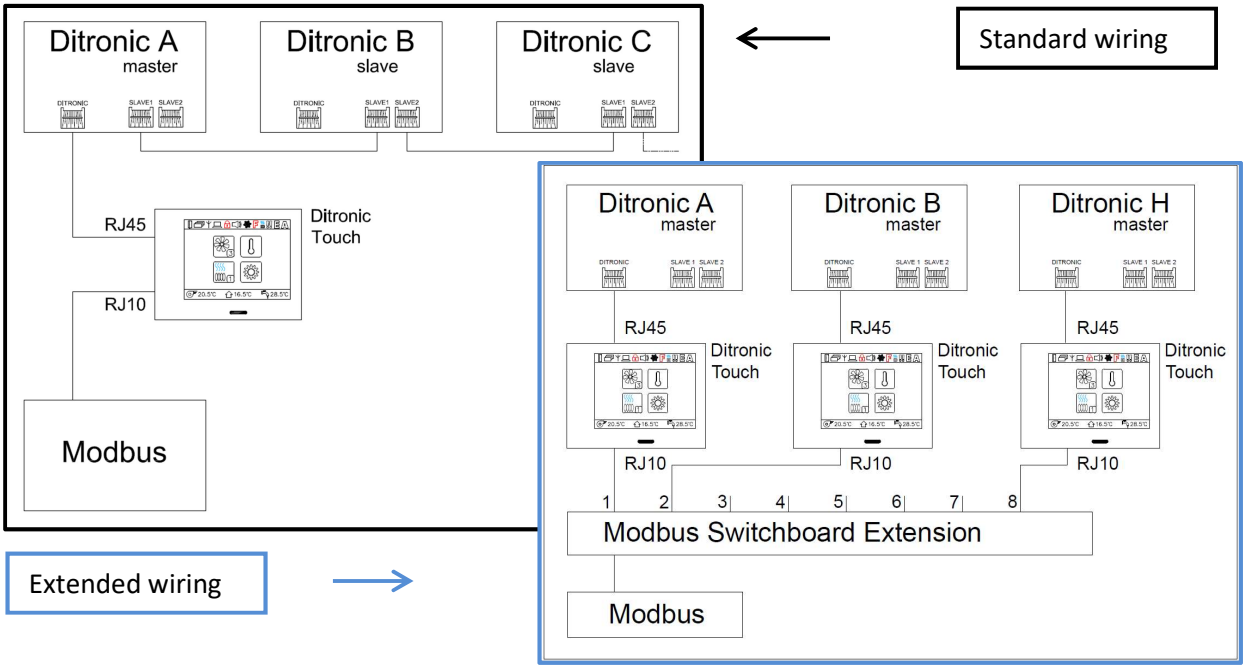
1. MODBUS wiring



Each Ditronic Touch controller is equipped with a 120Ω terminating resistor (terminator). It is not possible to control multiple units via one RS485 bus. **It is necessary to use the "master-slave" solution provided by the manufacturer.**

MODBUS - guaranteed functionality of the cable route up to 50 meters (MAX.), Without the use of passive connecting elements. Master / Slave - guaranteed functionality of the cable route up to 100 meters (MAX.), Without the use of passive connecting elements.

MODBUS + master/slave network



Modbus Switchboard Extension is an expansion element of the Modbus network, which correctly connects Touch controllers in a star topology. The wall switchboard enables the connection of 8 or more end devices. They can also be connected to each other. Individual requests must be separated from each other with a pre-defined time delay so that there is no overlap of the device's responses. The limit is set by the administrator of the Modbus network system - the recommendation is 80ms.

2. MODBUS Inputs & Outputs

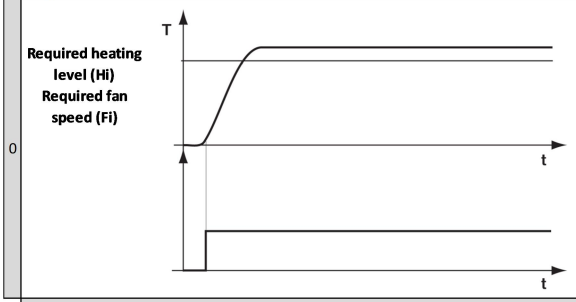
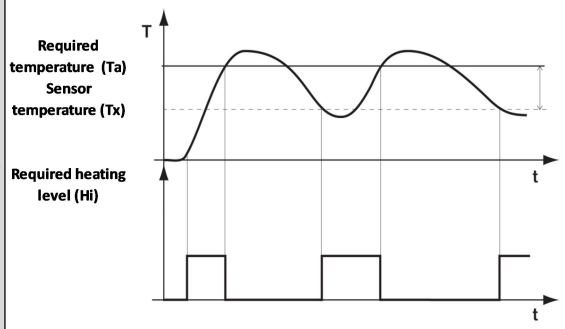
		Inputs		Outputs	
		Function	Parameter	Function	Parameter
Regulation	1	R	Room current temperature	R	Current fan status**
	2	R	Outlet current temperature		
	3	R	Medium current temperature*		
	4	R	Current outdoor temperature*		
	5	R/W	Required fan speed***		
	6	R/W	Required heating level***		
Functions	7	R	Door contact input status**		
	8	R/W	Anti-frost protection		
	9	R/W	Anti-frost temperature		
Corrections	10	R/W	Outlet temperature sensor correction		
	11	R/W	Room temperature sensor correction		
	12	R/W	Outside temperature sensor correction		
	13	R/W	Medium temperature sensor correction		
INFO parameters	14			R	AC/EC mode
	15			R	Bit Error Array
	16			R	Regulator registers states
	17			R	Software version

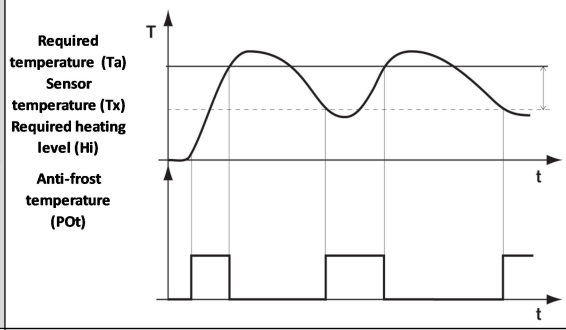
*Both sensors cannot be active at the same time.
** The controller has a double register for determining the status of the door contact. The first status is always available and indicates the status of the door contact terminals closed / open. The second register accesses the terminal states only after activating the door contact function manually via the controller display. This register can also be set using the associated door contact functions.
***The controller contains overload protection protocols. A combination of some heating levels and fan speeds is excluded. The heating is always activated automatically in parallel with the fan. The fan output can be active for a limited time even after it is switched off via the corresponding register - protective deceleration. The following also applies:

	Function WRITE			Function READ	
1	Heating ON	DEC register **8192**	=	Heating ON Fans ON	DEC register **8192** DEC register **4100**
2	Fans ON	DEC register **8191**	=	Fans ON	DEC register **8191**

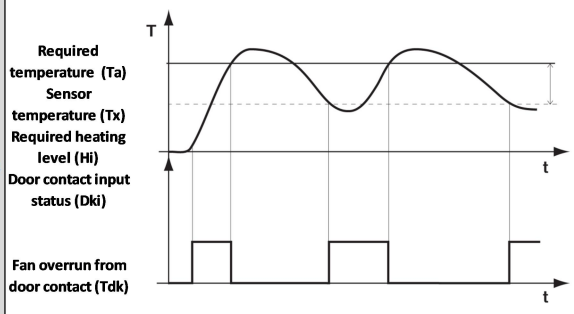
3. Application

- The listed operating modes are only recommendations and are based on the internal logic of the controller. Their implementation must be mediated by external software.

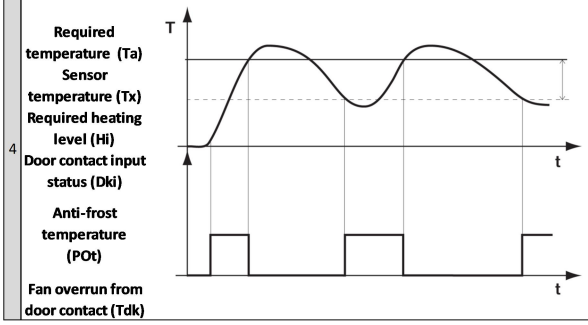
	ON/OFF	Inputs	Function	Outputs
0		Hi = 0-1 or 0-1-2-3 Fi = 0-1-2-3 or 0%-100%	Hi = Ho Fo = Fo	Ho = 0-1 or 0-1-2-3 Fo = 0-1-2-3 or 0%-100%
	Regulation	Inputs	Function	Outputs
1		Ta = software emulation Tb = software emulation Tx = room, outlet, medium, outside Hi = 0-1 or 0-1-2-3	**IF** (Tx < Ta - Tb); {Hi = Ho; }; **ELSE** {Ho = 0; };	Ho = 0-1 or 0-1-2-3 Fo = ... Automatic fan speed controlled by the regulator
	Regulation + anti-frost protection	Inputs	Function	Outputs

2		Ta = software emulation
		Tb = software emulation
		Tx = room, outlet, medium, outside
		POt = 10°C (default)
		Hi = 0-1
		or 0-1-2-3
			IF (Tx > POt);
			{ if (Tx < Ta - Tb);
			{Hi = Ho;
			};
			else {Ho = 0;
			};
			}
			ELSE {Ho = 2;
			};
				Ho = 0-1
				or 0-1-2-3
				Fo = ...
				Automatic fan speed controlled by the regulator

	Regulation + door contact	Inputs	Function	Outputs

3		Ta = software emulation
		Tb = software emulation
		Tx = room, outlet, medium, outside
		Dki = open (0) / closed (1)
		Tdk = (sec) software emulation
		Hi = 0-1
		or 0-1-2-3
			IF (Dki = 0);
			{ if (Tx < Ta - Tb);
			{Hi = Ho;
			};
			else {Ho = 0;
			};
			};
			ELSE {Ho = 0;
			};
				Ho = 0-1
				or 0-1-2-3
				Fo = ...
				Automatic fan speed controlled by the regulator

	Regulation + door contact + anti-frost protection	Inputs	Function	Outputs

4		Ta = software emulation
		Tb = software emulation
		Tx = room, outlet, medium, outside
		Dki = open (0) / closed (1)
		Tdk = (sec) software emulation
		POt = 10°C (default)
		Hi = 0-1
		or 0-1-2-3
			IF (Tx > POt);
			{ if (Dki = 0);
			{ if (Tx < Ta - Tb);
			{Hi = Ho;
			};
			else {Ho = 0;
			};
			};
			else {Ho = 0;
			};
			};
			ELSE {Ho = 2;
			};
				Ho = 0-1
				or 0-1-2-3
				Fo = ...
				Automatic fan speed controlled by the regulator

4. MODBUS communication interface parameters

Speed	Data bits	Parity	Stop bit	Speed	Data bits	Parity	Stop bit
9600 bps	8	even	1	19200 bps	8	even	1
9600 bps	8	none	2	19200 bps	8	none	2
9600 bps	8	odd	1	19200 bps	8	odd	1
9600 bps	8	none	1	19200 bps	8	none	1

5. MODBUS protocol mode

Supported mode of the MODBUS communication interface is RTU.

6. Supported functions

	DEC	HEX	Function	DEC	HEX	Function
READ	03	0x03	Read Holding Registers	04	0x04	Read Input Registers

	DEC	HEX	Function	DEC	HEX	Function
READ / WRITE	03	0x03	Read Holding Registers	04	0x04	Read Input Registers
	06	0x06	Write Single Register	16	0x10	Preset Multiple Registers

7. Read-only registers

	Adress		Function	Description	Values
	HEX	DEC			
1	0FFFh	4095	R	Room current temperature (x0,5°C)	0;255; 0 = 0° C 1 = 0,5° C ... 100 = 50° C 101 = 50,5° C ... 255 = 127,5° C
2	1000h	4096	R	Outlet current temperature (x0,5°C)	
3	1001h	4097	R	Medium current temperature (x0,5°C)	
4	1002h	4098	R	Version AC/EC	0;1; 0 = AC 1 = EC
5	1003h	4099	R	Activated door contact status (informative value only)	0;1; 0 = OPEN 1 = CLOSED

	Adress		Function	Description	Values
	HEX	DEC			
6	1004h	4100	R	Current fan status	0;3 AC; 0 = OFF 1 = 1.SPEED 2 = 2.SPEED 3 = 3.SPEED
					0;100 EC; 0 = OFF 1 = 1% ... 3 = 3% ... 100 = 100%
7	1005h	4101	R	Bit Error Array	
					HEX 0 / 1 / DEC 0 / 1
				Bit 0 / fan error	0x0000 / 0x0001 / 0 / 1
				Bit 1 / room t. sensor error	0x0000 / 0x0002 / 0 / 2
				Bit 2 / outlet t. sensor error	0x0000 / 0x0004 / 0 / 4
				Bit 3 / door curtain comm. error	0x0000 / 0x0008 / 0 / 8
				Bit 4 / anti-frost protection active	0x0000 / 0x0010 / 0 / 16
				Bit 5 / slave unit error	0x0000 / 0x0020 / 0 / 32
				Bit 6 / outdoor t. sensor error	0x0000 / 0x0040 / 0 / 64
				Bit 7 / medium t. sensor error	0x0000 / 0x0080 / 0 / 128
				* The output return value of a register can be the sum of several individual ones if different errors occur.	
8	1006h	4102	R	Current outdoor temperature (x0,5°C)	-127;128; -127 = -63,5° C -126 = -63° C ... -1 = -0,5° C 0 = 0° C 1 = 0,5° C ... 127 = 63,5° C 128 = 64° C
9	1007h	4103	R	Required temperature (x0,5°C) (informative value only)	0;255; 0 = 0° C 1 = 0,5° C ... 100 = 50° C 101 = 50,5° C ... 255 = 127,5° C

	Adress HEX	Adress DEC	Function	Description		Values
10	1008h	4104	R	Regulator registers states		
					HEX 0 / 1	DEC 0 / 1
				Bit 0 / -	-	-
				Bit 1 / Touch panel ON (HW button)	0x0000 / 0x0002	0 / 2
				Bit 2 / -	-	-
				Bit 3 / heating active	0x0000 / 0x0008	0 / 8
				Bit 4 / time plan active	0x0000 / 0x0010	0 / 16
				Bit 5 / outdoor temp. sensor active	0x0000 / 0x0020	0 / 32
				Bit 6 / door contact active	0x0000 / 0x0040	0 / 64
				Bit 7 / active E/T version (W/T def.)	0x0000 / 0x0080	0 / 128
				* The output return value of a register can be the sum of several individual ones if they coincide.		
11	1009h	4105	R	Version sw 1.26		0;255; 126
12	100Ah	4106	R	Door contact input status		0;1; 0 = OPEN 1 = CLOSED

8. WRITING REGISTERS

	Adress HEX	Adress DEC	Function	Description	Values
1	1FFFh	8191	R / W	Required fan speed	0;3 AC; 0 = OFF 1 = 1.SPEED 2 = 2.SPEED 3 = 3.SPEED
					0;100 EC; 0 = OFF 1 = 1% ... 3 = 3% ... 100 = 100%
2	2000h	8192	R / W	Required heating level	0;3 AC; 0 = OFF 1 = 1. LEVEL 2 = 2. LEVEL 3 = 3. LEVEL*

* Only available with W / T version of the controller

	Adress		Function	Description	Values
	HEX	DEC			
3	2001h	8193	R/W	Activation / deactivation anti-frost protection - 0 / OFF - 1 / active without Fans - 2 / active with Fans (DEFAULT)	0;1; 0 = OFF 1 = 1 2 = 2
4	2002h	8194	R/W	Anti-frost temperature - 10° C (DEFAULT)	5;20; 5 = 5° C ... 10 = 10° C ... 20 = 20° C
5	2003h	8195	R/W	Outlet temperature sensor correction	-20;20; -20 = -10° C ... -1 = -0,5° C 0 = 0° C 1 = 0,5° C ... 20 = 10° C
6	2004h	8196	R/W	Room temperature sensor correction	
7	2005h	8197	R/W	Outside temperature sensor correction	
8	2006h	8198	R/W	Medium temperature sensor correction	