Installation and User Guide

CTS 602 by Nilan

Modbus

Version: 4.00 28-07-2017
Software-version: 2.37 →

NILAN®
OUTSTANDING INDOOR CLIMATE

The following information describes how to connect to Nilan CTS 602 controls by means of a RS485 connection:

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Connection:

The Modbus is connected to PIN 2,3,6 on CN7 placed next to the USB port of the printed circuit board

Pin 1	12 VDC output
Pin 2	**COM1 - RS 485 A - Modbus**
Pin 3	**COM1 - RS 485 B - Modbus**
Pin 4	COM2 - RS 485 A - User panel
Pin 5	COM2 - RS 485 B - User panel
Pin 6	**Ground**

Setup:

Protocol	Modbus (RTU mode), see http://www.modbus.org/specs.php
Node address	Default 30, Address is selectable between 1 and 247 To be changed I SERVICE Menu.
Device type	CTS 602 is a Modbus slave
Baud rate	19.200
Databits	8
Stopbits	1
Parity	Even
Packet size	Max. 255 bytes

The communication speed and parameter can not be changed.

Supported functions:

Input and holding registers are supported.
All registers are 16 bit size.

The controller will respond to the below listed Modbus message functions only.
Please note that no other function codes are supported.

Function	Name	Description
03	Read Holding Registers	Read one or more holding registers
04	Read Input Registers	Read one or more input registers
16	Preset Multiple Registers	Write one or more holding registers

Register layout:

Register addresses are specified as decimal numerals.
Input registers are placed in the address area 30001..39999.
Holding registers are placed in the address area 40001..49999.

NOTE:
In the following tables, the register addresses applied in the MODBUS messages are without the global offset. This means that if you read input register 100 with function code 04, you will get the global address 30101.

NOTE:
All input registers can also be read as type holding register with function code 03 by adding the offset value 10000 to the register address. No writes will be accepted in this range.

Register groups

The protocol data is grouped into the following address ranges with 100 registers in each group. This applies to both input and holding register types:

Name	Address	Description	VPM	VPL	VP	VGU	COMF
Device	000	Protocol and controller setup	x	x	x	x	x
Discrete I/O	100	Input / output bits (on/off)	x	x	x	x	x
Analog I/O	200	Input / output words	x	x	x	x	x
Time	300	Clock and calendar	x	x	x	x	x
Alarm	400	Alarm and message handling	x	x	x	x	x
Week program	500	Calendar based programming	x	x	x	x	x
User functions	600	User input function selection	x	x	x	x	x
--	700	--					
--	800	--					
--	900	--					
Control	1000	System control and status	x	x	x	x	x
AirFlow	1100	Ventilation control	x	x	x	x	x
AirTemp	1200	Room temperature control	x	x	x		x
AirBypass	1300	Exchanger bypass control			x		x
AirHeat	1400	Inlet air heater control	x	x			x
Compressor	1500	Compressor operation control	x	x	x	x	
Defrost	1600	Defrosting control	x	x	x	x	x
HotWater	1700	Hot water control			x	x	
CentHeat	1800	Central water heat control (EK)			x	x	
AirQual	1900	Air quality control (RH, CO2)	x	x	x	x	x
User panel	2000	Display and keyboard	x	x	x	x	x
PreHeat	2100	Intake air preheat / earth tube			x		x
Display – Inputreg.	3000..3099	Input registers for display uses	--	--	--	--	--
Display – Holdingreg.	4000..4099	Holding registers for display uses	--	--	--	--	--

Input registers:

Name	Address	Scale	Unit	Description	Used to plant type
Bus.Version	000			Protocol version number	All plants
App.VersionMajor	001		text	Software version - major (2 character ascii text)	All plants
App.VersionMinor	002		text	Software version - minor (2 character ascii text)	All plants
App.VersionRelease	003		text	Software version - release (2 character ascii text)	All plants
Input.UserFunc	100			User function	All plants
Input.AirFilter	101			Air filter alarm	VPM-Comfort-Comforti
Input.DoorOpen	102			Door contact	VPM-Comforti
Input.Smoke	103			Fire/Smoke alarm	All plants
Input.MotorThermo	104			Motor thermo fuse	VPM-Comforti
Input.Frost_Overht	105			Heating surface frost / overheat	VPL-VPM-Compact-Comfort-Comforti
Input.AirFlow	106			Airflow monitor (guard)	VPL-VPM-Compact-Comfort-Comforti
Input.P_HI	107			High pressure switch	All Plants
Input.P_LO	108			Low pressure switch	Not in use
Input.Boil	109			Hot water boiling	VGU-VP-Compact
Input.3WayPos	110			Hot water 3-way valve position	Not in use
Input.DefrostHG	111			Hotgas defrost type selection	Not in use
Input.Defrost	112			Defrost thermostat	VPL-VPM-VGU-VP-Compact
Input.UserFunc_2	113			User function 2	VPL-VGU-VP-Compact-Comfort
Input.DamperClosed	114			Air damper closed position	Comfort-COMFORTi
Input.DamperOpen	115			Air damper opened position	Comfort-COMFORTi
Input.T0_Controller	200	100	°C	Controller board temperature	All plants
Input.T1_Intake	201	100	°C	Fresh air intake temperature	VPL-VPM-VGU-VP-Compact
Input.T2_Inlet	202	100	°C	Inlet temperature (before heater)	VPL-VPM-VP-Compact-Comfort-Comforti
Input.T3_Exhaust	203	100	°C	Room exhaust temperature	Comfort-Comforti
Input.T4_Outlet	204	100	°C	Outlet temperature	Compact-Comfort-Comforti
Input.T5_Cond	205	100	°C	Condenser temperature	VPL-VPM-VP-Compact
Input.T6_Evap	206	100	°C	Evaporator temperature	VPL-VPM-VGU-VP-Compact
Input.T7_Inlet	207	100	°C	Inlet temperature (after heater)	VPL-VPM-VP-Compact-Comfort-Comforti
Input.T8_Outdoor	208	100	°C	Outdoor temperature	Comfort-Comforti
Input.T9_Heater	209	100	°C	Heating surface temperature	VPL-VPM-Comfort-Comforti
Input.T10_Extern	210	100	°C	External room temperature	All plants
Input.T11_Top	211	100	°C	Hot water top temperature	VGU-VP-Compact

Name	Address	Scale	Unit	Description	Used to plant type
Input.T12_Bottom	212	100	°C	Hot water bottom temperature	VGU-VP-Compact
Input.T13_Return	213	100	°C	EK return temperature	VGU-VP
Input.T14_Supply	214	100	°C	EK supply temperature	VGU-VP
Input.T15_Room	215	100	°C	User panel room temperature	All plants
Input.T16	216	100	°C	AUX temperature (sacrificial anode)	VGU-VP-Compact
Input.T17	217	100	°C	Preheater or earth tube air intake temperature	
--	218..220			(reserved)	
Input.RH	221	100	%	Humidity	All plants
Input.CO2	222		ppm	Carbon dioxide	All plants

Alarm.Status	400			Alarm state bit mask 0x80 : Active alarm(s) present 0x03 : Nb. of alarms listed	All
Alarm.List_1_ID	401			Alarm 1 – Code 0x80 : (reserved future use) 0x7F : Display code 1..99	All
Alarm.List_1_Date	402			Alarm 1 – Date Bit word packed in DOS date format. Year 0 = 1980 15 8 7 0 HHHHHMMM MMMSSSSS	All
Alarm.List_1_Time	403			Alarm 1 – Time Bit word packed in DOS time format. Seconds are in scale 2 (0..29=0..58 seconds) 15 8 7 0 HHHHHMMM MMMSSSSS	All
Alarm.List_2_ID	404			Alarm 2 - Code	All
Alarm.List_2_Date	405			Alarm 2 - Date	All
Alarm.List_2_Time	406			Alarm 2 - Time	All
Alarm.List_3_ID	407			Alarm 3 - Code	All
Alarm.List_3_Date	408			Alarm 3 - Date	All
Alarm.List_3_Time	409			Alarm 3 - Time	All
Control.RunAct	1000			Actual on/off state 0 : Off 1 : On	All
Control.ModeAct	1001			Actual operation mode 0 : Off 1 : Heat 2 : Cool 3 : Auto 4 : Service	All

Name	Address	Scale	Unit	Description	Used to plant type
Control.State	1002			Actual control state 0 : Off 1 : Shift 2 : Stop 3 : Start 4 : Standby 5 : Ventilation stop 6 : Ventilation 7 : Heating 8 : Cooling 9 : Hot water 10 : Legionella 11 : Cooling + hot water 12 : Central heating 13 : Defrost 14 : Frost secure 15 : Service 16 : Alarm 17: Heating + hot water	All
Control.SecInState	1003		Sec	Actual time in state	All
AirFlow.VentSet	1100		Step	Actual ventilation step set point 0 : Off 1..4 : Step number	All
AirFlow.InletAct	1101		Step	Actual ventilation step set point 0 : Off 1..4 : Step number	All
AirFlow.ExhaustAct	1102		Step	Actual ventilation step set point 0 : Off 1..4 : Step number	All
AirFlow.SinceFiltDay	1103		Days	Days since last air filter change alarm One day is measured as 24 hours of active running time	All
AirFlow.ToFiltDay	1104		Days	Days to next air filter change alarm One day is measured as 24 hours of active running time	All
AirTemp.IsSummer	1200			Summer state 0 : Off 1 : On	All
AirTemp.TempInletSet	1201	100	°C	Inlet temperature request (T7 setpoint)	All
AirTemp.TempControl	1202	100	°C	Actual value for controlled temperature	All
AirTemp.TempRoom	1203	100	°C	Actual room temperature (T15 or T10)	All
AirTemp.EffPct	1204	100	%	Passive heat exchanger efficiency	Compact-Comfort-Comforti
AirTemp.CapSet	1205	100	%	Requested capacity	All plants
AirTemp.CapAct	1206	100	%	Actual capacity	All plants

Name	Address	Scale	Unit	Description	Used to plant type
CentralHeat.HeatExtSet	1800	100	°C	Actual setpoint for external heating source	All plants
Display.LED_1	2000			User panel indicator light	All plants
Display.LED_2	2001			(reserved future use)	All plants
Display.Text_1_2	2002		ascii	Text line 1 character 1-2	All plants
Display.Text_3_4	2003		ascii		All plants
Display.Text_5_6	2004		ascii		All plants
Display.Text_7_8	2005		ascii		All plants
Display.Attr_1_8	2006			Text line 1 flags	All plants
Display.Text_9_10	2007		ascii	Text line 2 character 9-16	All plants
Display.Text_11_12	2008		ascii		All plants
Display.Text_13_14	2009		ascii		All plants
Display.Text_15_16	2010		ascii		All plants
Display.Attr_9_16	2011			Text line 2 flags	All plants
PreHeat. BlockRemain	2100		Sec	Remaining time for the pre-heater blocking function Commanded by the HR 2100 register	Comfort-Comforti

Diplay

Name	Address	Scale	Unit	Description
AirBypass.IsOpen	3000			Bypass damper 0: Closed 1: Open
Output.AirHeatCap	3001	100	%	After heating element 0.00 – 100.00%
Defrost.ExchDefrost	3002			De-icing heat exchanger 0: Off 1: On (Passive exchanger defrost is active)
AirQual.CO2_Enable	3003			CO2 sensor present in the system or not 0: Off 1: On
AirFlow.RoomReduce	3004			Stop at low room temperature 0-4
AirFlow.LastTestDay	3005			Date for last air damper self-test Runtime hours is counted and formatted to days 0 - 65535
AirFlow.SinceFiltDay	3006			Days since last air filter change One day is measured as 24 hours of active running time. 0-9999
AirFLow.WinterReduce	3007			Low fan speed at low outdoor temperature Level 0-4
AirTemp.TempSet	3008	100	°C	Actual resulting set-point for room temperature 5.00°C - 50.00°C
AirTemp.TempControl	3009	100	°C	Master sensor for the controlled temperature (room / inlet) -40.00°C – 99.00°C
Alarm.LogEventID	3050			Event log ID (alarm code) 0 – 255
Alarm.LogDate	3051	DATE_DOS		Date of actual indexed event log
Alarm.LogTime	3052	TIME_DOS		Time of actual indexed event log
Alarm.LogT1	3053		°C	Log item data -127 - 127
Alarm.LogT3	3054			
Alarm.LogT4	3055			
Alarm.LogT5	3056			
Alarm.LogT6	3057			
Alarm.LogT7	3058			
Alarm.LogT8	3059			
Alarm.LogT9	3060			
Alarm.LogT10	3061			
Alarm.LogT11	3062			
Alarm.LogT12	3063			
Alarm.LogT13	3064			
Alarm.LogT14	3065			
Alarm.LogT15	3066			

Name	Address	Scale	Unit	Description
Alarm.LogDI_1_8i	3067			Log item digital input 1-8: bit 0 = input 1 bit 8 = input 8
Alarm.LogDI_9_16	3068			Log item digital input 9-16: bit 0 = input 9 bit 8 = input 16
Alarm.LogDO_1_8	3069			Log item digital output 1-8: bit 0 = output 1 bit 8 = output 8
Alarm.LogDO_9_16	3070			Log item digital output 9-16: bit 0 = output 9 bit 8 = output 16
Alarm.LogAO_1	3071		%	Log item analoge output 1 0 - 100
Alarm.LogAO_2	3072		%	Log item analoge output 2 0 – 100
Alarm.LogAO_3	3073		%	Log item analoge output 3 0 – 100
Alarm.LogAO_4	3074		%	Log item analoge output 4 0 - 100
Alarm.LogCtrState	3075			Operation states for Control module 0: OFF 1: SHIFTING 2: STOPPING 3: STARTING 4: STANDBY 5: VENT_STOP 6: AIR_EXCH 7: AIR_HEAT 8: AIR_COOL 9: HOTWATER 10: LEGIONELLA 11: AIR_COOL_HOT_WATER 12: CENT_HEAT 13: DEFROST 14: FROST 15: SERVICE 16: ALARM_SHUTDOWN 17: AIR_HEAT_HOT_WATER

Holding registers:

Name	Address	Scale	Unit	Description	Used to plant type
Bus.Address	0			Protocol node address (default = 30)	All plants
Output.AirFlap	100			Air flap	VPL-VPM-VGU-VP-Comfort-Comforti
Output.SmokeFlap	101			Fire/Smoke flap	VPM-Comforti
Output.BypassOpen	102			Bypass flap open	Compact-Comfort-Comforti
Output.BypassClose	103			Bypass flap close	Compact-Comfort-Comforti
Output.AirCircPump	104			Air heat circulation pump	VPM-Comfort-Comforti
Output.AirHeatAllow	105			Air heating selected	VPL-VPM-Compact-Comfort-Comfortit
Output.AirHeat_1	106			Air heater relays	VPM-Comforti
Output.AirHeat_2	107			--	VPM-Comforti
Output.AirHeat_3	108			--	VPM-Comforti
Output.Compressor	109			Compressor	VPL-VPM-VGU-VP-Compact
Output.Compressor_2	110			Compressor 2	Not in use
Output.4WayCool	111			4-way valve	VPL-VPM-VGU-Compact
Output.HotgasHeat	112			Hotgas valve - heat	VPM
Output.HotgasCool	113			Hotgas valve - cool	VPM
Output.CondOpen	114			Air condenser active	Compact
Output.CondClose	115			Air condenser inactive	Compact
Output.WaterHeat	116			Hot water heater	VGU-VP-Compact
Output.3WayValve	117			Hot water 3-way valve	Not in use
Output.CenCircPump	118			EK circulation pump	VGU-VP
Output.CenHeat_1	119			EK heater relays	VGU-VP
Output.CenHeat_2	120			--	VGU-VP
Output.CenHeat_3	121			--	VGU-VP
Output.CenHeatExt	122			External radiator heat	VPL-VP-Compact-Comfort
Output.UserFunc	123			User function active	All plants
Output.UserFunc_2	124			--	VPL-VGU-VP-Compact-Comfort
Output.Defrosting	125			Defrost function active	All plants
Output.AlarmRelay	126			Alarm relay state	All plants
Output.PreHeat	127			Preheater or earth tube activation	VPL-VGU-VP-Compact-Comfort
Output.ExhaustSpeed	200	100	**%**	Exhaust fan speed	All plants
Output.InletSpeed	201	100	%	Inlet fan speed	VPL-VPM-VP-Compact-Comfort-Comforti
Output.AirHeatCap	202	100	%	Air heater capacity	VPL-VPM-Compact-Comfort-Comforti

Name	Address	Scale	Unit	Description	Used to plant type
Output.CenHeatCap	203	100	%	Central heater capacity	VGU-VP
Output.CprCap	204	100	%	Compresor capacity	VPL-VPM-VGU-VP-Compact
Output.PreHeatCap	205	100	%	Preheater capacity or earth tube air intake fan speed	VPcCoB
Time.Second	300		ss	Second	All plants
Time.Minute	301		nn	Minute	All plants
Time.Hour	302		hh	Hour	All plants
Time.Day	303		dd	Day	All plants
Time.Month	304		mm	Month	All plants
Time.Year	305		yyyy	Year	All plants
Alarm.Reset	400			Clear one specific alarm code or all 0 : No command 1..99 : (reserved internal commands) 101..199 : Clear alarm display code 1..99 255 : Clear all alarms	All plants
Program.Select	500			Week program nb. select 0 : None 1 : Program 1 2 : Program 2 3 : Program 3 4 : Erase	All plants
Program.UserFuncAct	600			User function active (See “UserFuncSet”)	All plants
Program.UserFuncSet	601			User function select 0 : None 1 : Extend 2 : Inlet 3 : Exhaust 4 : External heater offset 5 : Ventilate 6 : Cooker Hood	All plants
Program.UserTimeSet	602		Min	Min User function period	All plants
Program.UserVentSet	603		Step	Step User function ventilation 0 : Off 1..4 : Step number	All plants
Program.UserTempSet	604	100	°C	User function temperature (Extend function only)	All plants
Program.UserOffsSet	605	100	°C	User function temperature(Offset function only)	All plants
Program.User2FuncAct	610			Same as user function 1 above	VPL-VGU-VP-Compact-Comfort

Name	Address	Scale	Unit	Description	Used to plant type
Program.User2FuncSet	611			--	VPL-VGU-VP-Compact-Comfort
Program.User2TimeSet	612			--	VPL-VGU-VP-Compact-Comfort
Program.User2VentSet	613			--	VPL-VGU-VP-Compact-Comfort
Program.User2TempSet	614			--	VPL-VGU-VP-Compact-Comfort
Program.User2OffsSet	615			--	VPL-VGU-VP-Compact-Comfort
Control.Type	1000			Machine type select	Do not use
Control.RunSet	1001			User on / off select (=ON/OFF keys) 0 : Off (user functions can still activate operation) 1 : On	All plants
Control.ModeSet	1002			User operation mode select 0 : Off 1 : Heat (no cooling active) 2 : Cool (no heating active) 3 : Auto 4 : Service (read only – write to register 1005)	All plants
Control.VentSet	1003		Step	User ventilation step select 0 : Off 1..4 : Step number	All plants
Control.TempSet	1004	100	°C	User temperature setpoint	All plants
Control.ServiceMode	1005			Service mode select 0 : Off 1 : Defrost 2 : Flaps 3 : Inlet 4 : Exhaust 5 : Compressor 6 : Heating 7 : Hot water 8 : Central heat	All plants
Control.ServicePct	1006	100	%	Service mode capacity	All plants
Control.Preset	1007			Request preset to factory settings 0 : Ready 1 : Standard (to factory default) 2 : Backup (to user file) 3 : Restore (from user file)	All plants
AirFlow.AirExchMode	1100			Air exchange mode 0 : Energy 1 : Comfort 2 : Comfort Water	VPL-VPM-VGU-VP-

Name	Address	Scale	Unit	Description	Used to plant type
AirFlow.CoolVent	1101		Step	Cooling high ventilation step	VPL-VPM-VP-Compact-Comfort-Comforti
AirFlow.TestSelect	1102			Select weekly air damper position self-test Once enabled, the function cannot be deactivated 0: Off 1: Wednesday 0400 2: Wednesday 1200	Comfort-Comforti
AirFlow.LastTestDay	1103			Date of last air damper position test Bit word packed in DOS date format (see IR 402 format)	Comfort-Comforti
AirFlow.TestState	1104			Actual air damper position test state 0: Off 1: Standby 2: Start(Set to Start to run manual test) 3: Closing 4: Opening 5: OK 6: Error	Comfort-Comforti
AirTemp.CoolSet	1200	100	°C	Cooling temperature setpoint select 0 : Off (No cooling allowed) 1 : Set + 0 °C (User setpoint plus 0 degrees) 2: Set + 1 °C 3: Set + 2 °C 4: Set + 3 °C 5: Set + 4 °C 6: Set + 5 °C 7: Set + 7 °C 8 : Set + 10 °C	VPL-VPM-VP-Compact-Comfort-Comforti
AirTemp.TempMinSum	1201	100	°C	Inlet temp. min. summer	VPL-VPM-VP-Compact-Comfort-Comforti
AirTemp.TempMinWin	1202	100	°C	Inlet temp. min. winter	VPL-VPM-VP-Compact-Comfort-Comforti
AirTemp.TempMaxSum	1203	100	°C	Inlet temp. max. summer	VPL-VPM-Comfort-Comforti
AirTemp.TempMaxWin	1204	100	°C	Inlet temp. max. winter	VPL-VPM-Comfort-Comforti
AirTemp.TempSummer	1205	100	°C	Summer/winter limit	VPL-VPM-VP-Compact-Comfort-Comforti
AirTemp.NightDayLim	1206	100	°C	Outdoor day temperature for night cooling activation [0:Off, 20..40]	
AirTemp.NightSet	1207	100	°C	Free energy night cooling room setpoint [10..30]	

Name	Address	Scale	Unit	Description	Used to plant type
HotWater.TempSet_T11	1700	100	°C	Top temperature setpoint (electric)	VGU-VP-Compact
HotWater.TempSet_T12	1701	100	°C	Bottom temperature setpoint (compressor)	VGU-VP-Compact
CentralHeat.HeatExtern	1800	100	°C	External heating offset from room temperature setpoint	VPL-VP-Compact-VPcCoB-
AirQual.RH_VentLo	1910		Step	Humidity low winter step select	All plants
AirQual.RH_VentHi	1911		Step	Humidity high step select	All plants
AirQual.RH_LimLo	1912	100	%	Humidity limit for low ventilation	
AirQual.RH_TimeOut	1913		min	Humidity max. time on high ventilation	All plants
AirQual.CO2_VentHi	1920		Step	CO2 high step select	All plants
AirQual.CO2_LimLo	1921		ppm	CO2 limit for normal ventilation	All plants
AirQual.CO2_LimHi	1922		ppm	CO2 limit for high ventilation	All plants
Display.KeyCode	2000			User panel keypress Repeated if not cleared within 400 ms Combined value with one bit for each key 0x01 : ESCAPE 0x02 : UP 0x04 : DOWN 0x08 : ENTER 0x10 : OFF 0x20 : ON	All plants
PreHeat. Block	2100			COMFORT(n) only Temporarily prevent pre-heater Operation (R5 output) Cannot be re-blocked before period has expired (IR2100) 0: No command 1: Set to request heater being blocked (for 2 hours)	

Display

Name	Address	Scale	Unit	Description
CentralHeat.HeatExtern	4000	100	°C	Regulation deadband external room heating -5.00°C – 5.00°C
AirFlow.CoolVent	4001			High fan speed at high indoor temp (cooling demand) Level OFF, 2-4
AirFlow.WinterTemp	4002		°C	Low outdoor temperature -20°C - 10°C
AirFlow.WinerVent	4003			Fan speed at low outdoor temperature 0: OFF 1 - 3: Level
AirFlow.TestSelect	4004			Day for automatic test 0: OFF 1: Mo 2: Tu 3: We 4: Th 5: Fr 6: Sa 7: Su
AirHeat.Type	4005			After heating type 0: No additional heat 1: Electrical 2: Electric on binary relays 3: Water
AirHeat.Delay	4006		min	Delay timer for after-heat activation 0-60 min.
AirTemp.TempMinSum	4007	100	°C	Summer minimum supply air temperature MinSum: 5.00-14.00
AirTemp.TempMaxSum	4008	100	°C	Summer maximum supply air temperature MaxSum: 5.00-25.00
AirTemp.TempMinWin	4009	100	°C	Winter minimum supply air temperature MinWin: 5.00-16.00
AirTemp.TempMaxWin	4010	100	°C	Winter maximum supply air temperature MaxWin: 5.00-35.00
AirTemp.RoomNZ	4011	100		Room temperature regulation deadband 0.20 – 10.00
AirTemp.TempRoomLow	4012	100	°C	Low room temperature for stepwise reduced ventilation 0: OFF 1.00°C – 20.00°C
Defrost.Fans	4020			Frost protection or de-icing - Ventilation level 0: OFF 1 : USER 2: LOW
Defrost.Bypass	4021			Frost protection or de-icing - Bypass position 0: OFF 1: ON
Defrost.BlockMinutes	4022		Min	Frost protection or de-icing - Time between activations 15 - 720
Defrost.TempStart	4023	100	°C	Frost protection or de-icing - Start criteria -10.00°C – 0.00°C
Defrost.TempStop	4024	100	°C	Frost protection or de-icing - Stop criteria 2.00°C – 12.00°C
Defrost.DurMaxCpr	4025		Min	Frost protection or de-icing - Max duration compressor 2 – 60
Defrost.DurMaxExh	4026		Min	Frost protection or de-icing - Max duration exchanger 5 – 60

Name	Address	Scale	Unit	Description
Program.EditIndex	4030			Week program Index: 0-41 (7 days multiply by 6 functions each day)
Program.EditPeriod	4031			Week program Day index: 0-6 (0=Monday..)
Program.EditPeriodNx	4032			Week program Next day index: 0-6 (0=Monday..)
Program.EditFunc	4033			Week program Day function 0-
Program.EditTimeStar	4034			Week program Start time: 0000 – 2345: 0800 = 8:00, 1215 = 12:15
Program.EditVent	4035			Week program Fan settings: 0- 4 0=Off, 1-4 Level
Program.EditTemp	4036		°C	Week program Temperature: 5°C -
Control.RestartMode	4040			External fire alarm auto reset 0: OFF 1: HPLP 2: CONTINUE 3: SELF_CLEAR
Alarm.LogIndex	4050			Alarm log index 0 - 15

Communication example

The sample shown below is a general Modbus communication example, and is not specific for this device.

Request: 0b041000000e75a4
Response: 0b041cffff0000095008b0e4a80014000b000108e108f1ffff000f0002fff39f8e'

Request (Input register)

0x0b	Slave addr	1 byte
0x04	Function code	1 byte
0x1000	Start addr	2 bytes
0x000e	Quantity	2 bytes
0x75a4	CRC	2 bytes

Response

0x0b	Addr	1 byte
0x04	Function code	1 byte
0x1c	NB bytes of data	1 byte
0xffff	Value1	2 bytes
0x0000	Value2	2 bytes
0x0950	Value3	2 bytes
0x08b0	Value4	2 bytes
0xe4a8	Value5	2 bytes
0x0014	Value6	2 bytes
0x000b	Value7	2 bytes
0x0001	Value8	2 bytes
0x08e1	Value9	2 bytes
0x08f1	Value10	2 bytes
0xffff	Value11	2 bytes
0x000f	Value12	2 bytes
0x0002	Value13	2 bytes
0xfff3	Value14	2 bytes
0x9f8e	CRC	2 bytes

Request 0b03200000018f60
Response: 0b030200002045

Request (Holding register)

0x0b	Slave addr	1 byte
0x03	Function code	1 byte
0x2000	Address	2 bytes
0x0001	Quantity	2 bytes
0x8f60	CRC	2 bytes

Response

0x0b	Slave addr	1 byte
0x03	Function code	1 byte
0x02	Quantity	1 byte
0x0000	Value1	2 bytes
0x2045	CRC	2 bytes

Alarm list

Alarms are divided into these categories:

LOG: Information only visible in Alarm Log and Data Log
INFO: Information can be confirmed with the same
WARNING: Warning, may become critical if the problem are not corrected
CRITICAL: Operation is stopped until the fault is corrected and the alarm is acknowledged
RS: Restart (automatic restart when errors are OK, if selected by menu)
SC: Self clearing (when receipted pending state again is OK)

See specification and user manual for each plant for a further description of alarms.

Code	Text	Type	Subsystem	Function
0	NONE	NONE	System	No alarm
1	HARDWARE	CRITICAL	System	Electrical faults (eg, Ur-circuit)
2	TIMEOUT	CRITICAL	System	A WARNING has been critically
3	FIRE	CRITICAL	AirFlow	Fire thermostat
4	PRESSURE	CRITICAL + RS	Compressor	High or low pressure pressure switch
5	DOOR	CRITICAL + SC	AirFlow	Inspection door open
6	DEFROST	INFO	Defrost	Defrosting time exceeded (compressor)
7	FROST	CRITICAL	AirTemperature	Plants without T9 sensor: - Water coil freeze thermostat triggered Systems with T9 sensor - Water surface could not reach 20 ° C within 6 min.
8	FROST	CRITICAL + SC	AirTemperature	Only plants with T9 sensor - Water coil freeze thermostat triggered
9	OVERTEMP	INFO + SC	CentralHeat	Kettle over temperature (TMax +10 ° C)
10	OVERHEAT	INFO + SC	AirHeat	Electric reheating overheating
11	AIRFLOW	INFO + SC	AirHeat	Electric reheating lack of air flow
12	THERMO	CRITICAL	AirFlow	Ventilation Motor thermal switch
13	BOILING	CRITICAL	HotWater	DHW Water boiling
14	SENSOR	CRITICAL	AirTemperature	Elected steered sensor is defect
15	ROOM LOW	CRITICAL	AirFlow	Room temperature below the set minimum. Winter protection (reduced ventilation) is without effect.
16	SOFTWARE	INFO	System	Program startup / main loop
17	WATCHDOG	INFO	System	Program execution errors
18	CONFIG	INFO	System	Database content changed - check settings (eg after software update)
19	FILTER	INFO	AirFlow	Air filter pressure switch or timer
20	LEGIONEL	INFO	HotWater	Legionella Function not executed within the time limit for the allowed number of attempts
21	POWER	INFO	System	Power outage longer than the backup time on clock circuit
22	T AIR	INFO	AirTemperature	Air temperature errors
23	T WATER	INFO	HotWater	DHW temperature errors
24	T HEAT	INFO	CentralHeat	Central heating temperature errors
25	MODEM	INFO	System	Communication error modem (only CTS 600 G1)

26	INSTABUS	INFO	System	Communication errors network (CTS 600 G1)
27	T1SHORT	CRITICAL	System	Temperature sensor shorted
28	T1OPEN	CRITICAL	System	Temperature sensor disconnected
29	T2SHORT	CRITICAL	System	Temperature sensor shorted
30	T2OPEN	CRITICAL	System	Temperature sensor disconnected
31	T3SHORT	CRITICAL	System	Temperature sensor shorted
32	T3OPEN	CRITICAL	System	Temperature sensor disconnected
33	T4SHORT	CRITICAL	System	Temperature sensor shorted
34	T4OPEN	CRITICAL	System	Temperature sensor disconnected
35	T5SHORT	CRITICAL	System	Temperature sensor shorted
36	T5OPEN	CRITICAL	System	Temperature sensor disconnected
37	T6SHORT	CRITICAL	System	Temperature sensor shorted
38	T6OPEN	CRITICAL	System	Temperature sensor disconnected
39	T7SHORT	CRITICAL	System	Temperature sensor shorted
40	T7OPEN	CRITICAL	System	Temperature sensor disconnected
41	T8SHORT	CRITICAL	System	Temperature sensor shorted
42	T8OPEN	CRITICAL	System	Temperature sensor disconnected
43	T9SHORT	CRITICAL	System	Temperature sensor shorted
44	T9OPEN	CRITICAL	System	Temperature sensor disconnected
45	T10SHORT	CRITICAL	System	Temperature sensor shorted
46	T10OPEN	CRITICAL	System	Temperature sensor disconnected
47	T11SHORT	CRITICAL	System	Temperature sensor shorted
48	T11OPEN	CRITICAL	System	Temperature sensor disconnected
49	T12SHORT	CRITICAL	System	Temperature sensor shorted
50	T12OPEN	CRITICAL	System	Temperature sensor disconnected
51	T13SHORT	CRITICAL	System	Temperature sensor shorted
52	T13OPEN	CRITICAL	System	Temperature sensor disconnected
53	T14SHORT	CRITICAL	System	Temperature sensor shorted
54	T14OPEN	CRITICAL	System	Temperature sensor disconnected
55	T15SHORT	CRITICAL	System	Temperature sensor shorted
56	T15OPEN	CRITICAL	System	Temperature sensor disconnected
57	T16SHORT	CRITICAL	System	Temperature sensor shorted
58	T16OPEN	CRITICAL	System	Temperature sensor disconnected
70	ANODE	INFO + SC	HotWater	DHW tank anode corroded and needs replacing (The alarm is deactivated by lice or disconnection)
71	EXCH INFO	INFO	Defrost	Defrost time exceeded (exchanger)
72	EVAP LOW	CRITICAL	Compressor	Unexpected low evaporator temp T6, due to too low airflow (only for Compact / Combi plants)
90	SLAVE IO	CRITICAL + SC	System	(not relevant for the CTS 602)
91	OPT IO	INFO + SC	System	Options Module missing
92	PRESET	INFO	System	Error while writing or reload installer settings (PRESET menu)
95	SW RJECT	INFO	System	Software update is rejected due to missing Support for newer hardware in older software Version (SW2.30+)
96	DAMPTEST	CRITICAL	Air Flow	Self-test of damper moving time has failed. Check power for damper, opening/ closing contacts and setting of operation time.

Connection diagram