

Climatix™

Modbus communication, slave mode

Reference addresses

for standard AHU application v1.0x

Siemens Switzerland Ltd.
Building Technologies Group
International Headquarters
Gubelstrasse 22
CH-6301 Zug
Tel. +41 41-724 24 24
Fax +41 41-724 35 22
www.siemens.com/sbt

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1 About this document

1.1 Revision history

Version	Date	Changes	Section	Pages
1.0	01.03.2010	First edition		

1.2 Before you start

Validity

This document applies to the following product:

Name	Type (ASN)	Version
Siemens standard AHU application	POL63x.00/AHU	1.06



This document is a supplement to the general integration guide for Climatix Modbus communication, slave mode. That document must be read first and all general information such as document conventions, important information on safety, trademarks, copyright etc. are valid for this document as well.



This document only contains the unique information for the product mentioned above. All general engineering information such as mounting modules, communication settings etc. are described in the integration guide.

Prerequisite

User has read the general Modbus integration guide for Climatix, CB1J3960en.

1.3 Reference documents

Further information

The following documents contain additional information on the products described in this manual:

Document	Order no.
Data sheet "Communication module Modbus"	CB1Q3934en
Basic documentation "Modbus communication module"	CB1P3934en
Integration Guide "Modbus communication, slave mode"	CB1J3960en
Basic documentation "Standard Application AHU"	CB1P3977en

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2 Application

2.1 General information

What are standard applications?

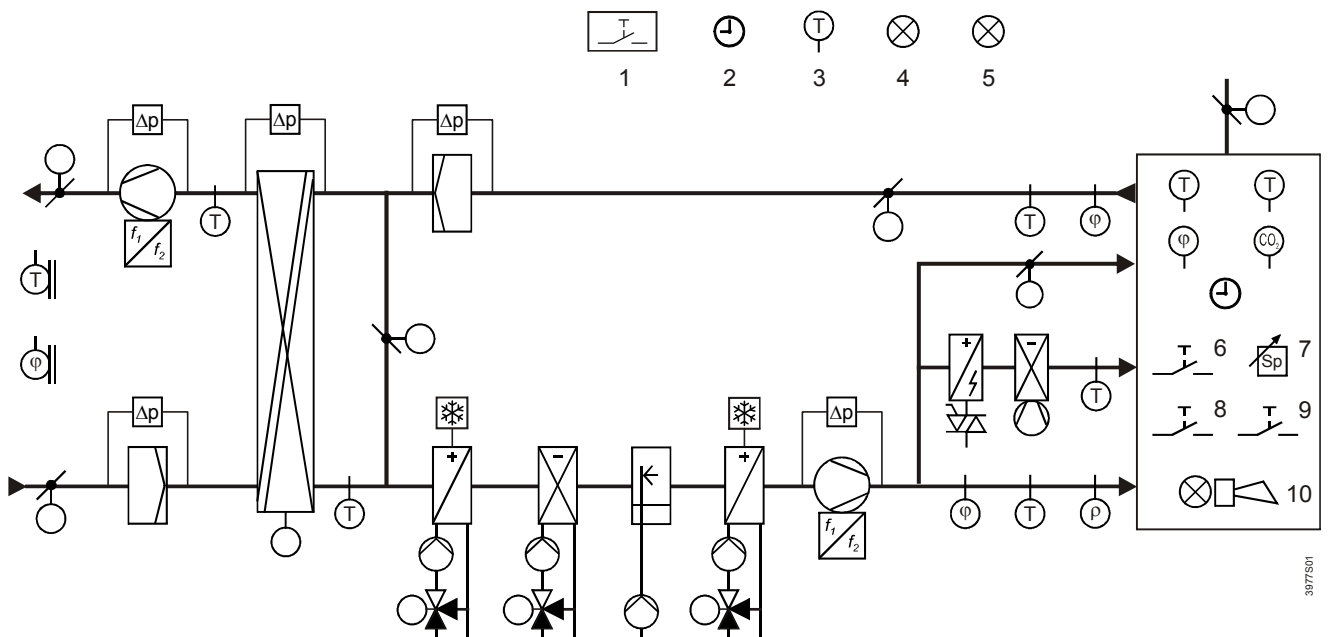
Standard applications for Climatix comprise predefined monitoring and control functions for a particular plant type.

Features:

- OEM customers receive standard applications as a set of loadable files. They can be loaded in the controller via SD card.
- An HMI operator unit allows for assigning inputs and outputs to the respective plant as well as select, configure and parameterize the required functions.

Standard application AHU V1.x

Standard application AHU V1.x is available at this time. It contains all common functions to control and monitor air conditioning units (**Air Handling Units**). The following diagram provides an overview of selectable measured values and control equipment:



Detailed information

See document CE1P3977en for a detailed description of standard application AHU V1.x.

Modbus registers

The set of loadable files mentioned above also includes a mapping file for integration in a higher building automation and control system via communications module. The Climatix controller automatically assumes the Modbus registers required for integration as per the plant data points and functions configured and parameterized previously.

The following tables list the predefined Modbus registers supporting standard application AHU V1.x to ensure standardized and simple integration.

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3 Reference Modbus addresses

3.1 General

Purpose

This section describes the reference addresses used in the specific application, see chapter 1.2 "Before you start".

Modbus data formats

Modbus type	Description	Reference	Datatype
Coil status	Read/Write Discrete output	0x	1bit
Input states	Read Discrete input	1x	1bit
Input register	Read Input register	3x	16bit signed or unsigned word
Holding register	Read/Write Output register	4x	16bit signed or unsigned word

Addresses used

All reference addresses from 0001-0125 for on-board and -1000 for module are generated and can be accessed even if not listed. As a result, multiple coils/registers can be forced/reset even if there is a gap between two reference addresses.



Do not read/write any addresses above 0125/1000. Doing so causes an exception and communication fails.

All address types starts with 1, and due to that some Master devices starts with 0 it's in that case necessary to subtract all addresses in this document with 1.

Presentation

Values and states are presented as follows:

- 16 bit real values are presented in their actual value/unit. E.g. °C, %, Pa, l/s (Normally Signed Word).
- 16 bit states are presented as a number, see the reference address description (Unsigned Word). Texts for each state are represented in the last column separated with * (Example Off*On = 0=Off and 1=On)
- 1 bit status are presented as 0=Off and 1=On.
- 1 bit alarms are presented as 0=Normal and 1=Alarm.



Alarms and status are presented both as input states and as input registers.

Examples

A real value is 215, and presented by a 16 bit register binary as:
MSB 11010111 LSB.

The 16 bit register "BMS override time program" is used and set binary to state 6:
MSB 00000110 LSB.

Decimals

When Modbus uses a 16 bit register to handle real values, a factor is needed for decimals. E.g. factor 10 for 1 decimal, factor 100 for 2 decimals, etc.

Example 1: Present values

The present supply air temperature is 20.6 °C and is multiplied by 10 in the Climatix controller. It is presented as 206 at Modbus and must be divided by 10 in the master device to return to 20.6 °C.

Example 2: Setpoints

To set the temperature setpoint 21.5°C at the master device, multiply it by 10 to present it as 215 at Modbus. The Climatix controller then divides by 10 to return to 21.5 °C.

Override I/Os

Inputs that are possible to override via Modbus is marked with (I/O), these must first be setup to be overridden via communication, see Integration guide.

3.2 Coil status

Table of coil states

Address	Description	Values /Units	Remarks
Present value			
0x0001	Alarm acknowledge	0-1	Off*On
0x0002	Enable communicationtest	0-1	No*Yes
0x0003	Communicationtest puls	0-1	0*1
0x0004	Fire damper test	0-1	Passive*Active
0x0007	Energymeeter reset partial	0-1	Passive*Active
Tracking value			
0x0011	Emergency stop input	0-1	Off*On, (I/O)
0x0012	External control input 1	0-1	Off*On, (I/O)
0x0013	External control input 2	0-1	Off*On, (I/O)
0x0014	Summer/Winter changeover input	0-1	Winter*Summer, (I/O)
0x0015	Fire alarm input	0-1	OK*Alarm, (I/O)

3.3 Input states

Table of input states

Address	Description	Values /Units	Remarks
Present value			
1x0001	Alarm class Danger alarm (A) status	0-1	Normal*Alarm
1x0002	Alarm class Critical alarm (A) status	0-1	Normal*Alarm
1x0003	Alarm class Low alarm (B) status	0-1	Normal*Alarm
1x0004	Alarm class Warning alarm (C) status	0-1	Normal*Alarm
1x0005	Manual mode	0-1	Auto*Manual
1x0006	Communicationtest puls	0-1	0*1
1x0011	Emergency stop input	0-1	Off*On
1x0012	External control input 1	0-1	Off*On
1x0013	External control input 2	0-1	Off*On
1x0014	Summer/Winter changeover input	0-1	Winter*Summer
1x0015	Auxiliary input	0-1	Off*On
Alarm value			
1x0020	Outside air damper feedback	0-1	OK*Alarm
1x0021	Extract air damper feedback	0-1	OK*Alarm
1x0022	Fire damper closed	0-1	OK*Alarm
1x0023	Fire damper opened	0-1	OK*Alarm
1x0024	Fire damper no move	0-1	OK*Alarm
1x0026	Fan alarm	0-1	OK*Alarm
1x0027	Supply fan alarm	0-1	OK*Alarm
1x0028	Supply fan feedback	0-1	OK*Alarm
1x0029	Supply fan deviation alarm	0-1	OK*Alarm
1x0030	Exhaust fan alarm	0-1	OK*Alarm

Input states, *continued*

Table of input states,
cont.

Address	Description	Values /Units	Remarks
1x0031	Exhaust fan feedback	0-1	OK*Alarm
1x0032	Exhaust fan deviation alarm	0-1	OK*Alarm
1x0033	Fan operating hours alarm	0-1	OK*Alarm
1x0036	Cooling DX alarm	0-1	OK*Alarm
1x0037	Cooling DX feedback	0-1	OK*Alarm
1x0038	Cooling pump alarm	0-1	OK*Alarm
1x0039	Cooling pump feedback	0-1	OK*Alarm
1x0040	Heat recovery alarm	0-1	OK*Alarm
1x0041	Heat recovery pump alarm	0-1	OK*Alarm
1x0042	Heat recovery pump feedback	0-1	OK*Alarm
1x0043	Heat recovery frost monitor	0-1	OK*Alarm
1x0044	Heat recovery efficiency alarm	0-1	OK*Alarm
1x0045	Heating pump alarm	0-1	OK*Alarm
1x0046	Heating pump feedback	0-1	OK*Alarm
1x0047	Heating frost monitor	0-1	OK*Alarm
1x0048	Electrical heating alarm	0-1	OK*Alarm
1x0049	Cooling 2 DX alarm	0-1	OK*Alarm
1x0050	Cooling 2 DX feedback	0-1	OK*Alarm
1x0051	Cooling 2 pump alarm	0-1	OK*Alarm
1x0052	Cooling 2 pump feedback	0-1	OK*Alarm
1x0053	Heating 2 pump alarm	0-1	OK*Alarm
1x0054	Heating 2 pump feedback	0-1	OK*Alarm
1x0055	Heating 2 frost monitor	0-1	OK*Alarm
1x0056	Electrical heating 2 alarm	0-1	OK*Alarm
1x0057	Supply temperature deviation	0-1	OK*Alarm
1x0058	Room temperature deviation	0-1	OK*Alarm
1x0062	Humidifier feedback	0-1	OK*Alarm
1x0063	Humidity pump alarm	0-1	OK*Alarm
1x0064	Humidity pump feedback	0-1	OK*Alarm
1x0065	Supply hum deviation	0-1	OK*Alarm
1x0066	Room hum deviation	0-1	OK*Alarm
1x0067	Dew point	0-1	OK*Alarm
1x0070	Filter alarm	0-1	OK*Alarm
1x0071	Supply filter alarm	0-1	OK*Alarm
1x0072	Exhaust filter alarm	0-1	OK*Alarm
1x0073	Fire alarm	0-1	OK*Alarm
1x0074	Supply temperature fire alarm	0-1	OK*Alarm
1x0075	Exhaust temperature fire alarm	0-1	OK*Alarm
1x0076	Auxiliary alarm	0-1	OK*Alarm
1x0077	Manual mode	0-1	OK*Alarm
1x0078	Modbus comm alarm	0-1	OK*Alarm

Input states, *continued*

Table of input states,
cont.

Address	Description	Values /Units	Remarks
1x0080	Outside air temperature	0-1	OK*Alarm
1x0081	Supply air temperature	0-1	OK*Alarm
1x0082	Heating frost temperature	0-1	OK*Alarm
1x0083	Room temperature	0-1	OK*Alarm
1x0084	Room temperature 2	0-1	OK*Alarm
1x0085	Exhaust air temperature	0-1	OK*Alarm
1x0086	Extract air temperature	0-1	OK*Alarm
1x0087	Heat recovery supply air temperature	0-1	OK*Alarm
1x0088	Heat recovery water temperature	0-1	OK*Alarm
1x0089	Supply air temperature 2	0-1	OK*Alarm
1x0090	Heating 2 frost temperature	0-1	OK*Alarm
1x0091	Auxiliary temperature	0-1	OK*Alarm
1x0092	Outside air humidity relative	0-1	OK*Alarm
1x0093	Supply air humidity relative	0-1	OK*Alarm
1x0094	Room humidity relative	0-1	OK*Alarm
1x0095	Supply air flow	0-1	OK*Alarm
1x0096	Exhaust air flow	0-1	OK*Alarm
1x0097	Supply air pressure	0-1	OK*Alarm
1x0098	Exhaust air pressure	0-1	OK*Alarm
1x0099	Heat recovery frost pressure	0-1	OK*Alarm
1x0100	Air quality	0-1	OK*Alarm
1x0101	External setpoint	0-1	OK*Alarm
1x0102	Roomunit 1	0-1	OK*Alarm
1x0103	Roomunit 2	0-1	OK*Alarm

3.4 Input register

Input register table

Address	Description	Values /Units	Remarks
Unsigned Word			
3x0001	General status (Word 1)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	- Alarm class danger (A)		
Bit1	- Alarm class critical (A)		
Bit2	- Alarm class low (B)		
Bit3	- Alarm class warning (C)		
Bit4	-		
Bit5	- Manual control active		
Bit6	- Summer mode		
Bit7	- Communicationtest puls		
Bit8	- Preheating, heating register		
Bit9	- Preheating, extra heating register		
Bit10	-		
Bit11	- Actual control mode temp, room		
Bit12	- Actual control mode temp, exhaust		
Bit13	- Actual control mode temp, supply		
Bit14	- Actual control mode humidity, room		
Bit15	- Actual control mode humidity, supply		
3x0002	General status (Word 2)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	-		
Bit1	-		
Bit2	-		
Bit3	-		
Bit4	-		
Bit5	-		
Bit6	-		
Bit7	-		
Bit8	-		
Bit9	-		
Bit10	-		
Bit11	-		
Bit12	-		
Bit13	-		
Bit14	-		
Bit15	-		
3x0003	General status (Word 3)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	-		
Bit1	-		
Bit2	-		
Bit3	-		
Bit4	-		
Bit5	-		
Bit6	-		
Bit7	-		
Bit8	-		
Bit9	-		
Bit10	-		
Bit11	-		
Bit12	-		
Bit13	-		
Bit14	-		
Bit15	-		

Input register, *continued*

Input register table,
cont.

Address	Description	Values /Units	Remarks
3x0004	General status (Word 4)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	-		
Bit1	-		
Bit2	-		
Bit3	-		
Bit4	-		
Bit5	-		
Bit6	-		
Bit7	-		
Bit8	-		
Bit9	-		
Bit10	-		
Bit11	-		
Bit12	-		
Bit13	-		
Bit14	-		
Bit15	-		
3x0005	Digital inputs (Word 1)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	- Emergency stop		
Bit1	- External control 1		
Bit2	- External control 2		
Bit3	- Summer/winter changeover		
Bit4	- Alarm acknowledge		
Bit5	-		
Bit6	-		
Bit7	-		
Bit8	- Aux input		
Bit9	-		
Bit10	-		
Bit11	-		
Bit12	-		
Bit13	-		
Bit14	-		
Bit15	-		
3x0006	Digital inputs (Word 2)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	- Dampers open		
Bit1	- Fire dampers open		
Bit2	- Fire dampers closed		
Bit3	-		
Bit4	- Supply fan feedback		
Bit5	- Exhaust fan feedback		
Bit6	-		
Bit7	-		
Bit8	-		
Bit9	-		
Bit10	-		
Bit11	-		
Bit12	-		
Bit13	-		
Bit14	-		
Bit15	-		

Input register, *continued*

Input register table,
cont.

Address	Description	Values /Units	Remarks
3x0007	Digital inputs (Word 3)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	-		
Bit1	-		
Bit2	-		
Bit3	-		
Bit4	-		
Bit5	-		
Bit6	-		
Bit7	-		
Bit8	-		
Bit9	-		
Bit10	-		
Bit11	-		
Bit12	-		
Bit13	-		
Bit14	-		
Bit15	-		
3x0008	Digital inputs (Word 4)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	-		
Bit1	-		
Bit2	-		
Bit3	-		
Bit4	-		
Bit5	-		
Bit6	-		
Bit7	-		
Bit8	-		
Bit9	-		
Bit10	-		
Bit11	-		
Bit12	-		
Bit13	-		
Bit14	-		
Bit15	-		
3x0009	Digital outpututs (Word 1)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	- Supply damper		
Bit1	- Extract damper		
Bit2	- Fire damper		
Bit3	-		
Bit4	- Supply fan, running		
Bit5	- Supply fan, off		
Bit6	- Supply fan, stage 1		
Bit7	- Supply fan, stage 2		
Bit8	- Supply fan, stage 3		
Bit9	- Exhaust fan, running		
Bit10	- Exhaust fan, off		
Bit11	- Exhaust fan, stage 1		
Bit12	- Exhaust fan, stage 2		
Bit13	- Exhaust fan, stage 3		
Bit14	-		
Bit15	-		

Input register, *continued*

Input register table,
cont.

Address	Description	Values /Units	Remarks
3x0010	Digital outpututs (Word 2)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	- Cooling pump		
Bit1	- Cooling DX, off		
Bit2	- Cooling DX, stage 1		
Bit3	- Cooling DX, stage 2		
Bit4	- Cooling DX, stage 3		
Bit5	-		
Bit6	- Heating recovery pump/command		
Bit7	-		
Bit8	- Heating pump		
Bit9	-		
Bit10	- Electrical heating, off		
Bit11	- Electrical heating, stage 1		
Bit12	- Electrical heating, stage 2		
Bit13	- Electrical heating, stage 3		
Bit14	-		
Bit15	-		
3x0011	Digital outpututs (Word 3)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	- Extra cooling (2) pump		
Bit1	- Extra cooling (2) DX, off		
Bit2	- Extra cooling (2) DX, stage 1		
Bit3	- Extra cooling (2) DX, stage 2		
Bit4	- Extra cooling (2) DX, stage 3		
Bit5	-		
Bit6	- Extra heating (2) pump		
Bit7	-		
Bit8	- Extra electrical heating (2), off		
Bit9	- Extra electrical heating (2), stage 1		
Bit10	- Extra electrical heating (2), stage 2		
Bit11	- Extra electrical heating (2), stage 3		
Bit12	-		
Bit13	- Humidity command		
Bit14	- Humidity pump		
Bit15	-		
3x0012	Digital outpututs (Word 4)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	- Aux TSP command		
Bit1	- Aux operation mode indication		
Bit2	-		
Bit3	-		
Bit4	-		
Bit5	-		
Bit6	-		
Bit7	-		
Bit8	- Alarm output, high (and low)		
Bit9	- Alarm output, low		
Bit10	-		
Bit11	-		
Bit12	-		
Bit13	-		
Bit14	-		
Bit15	-		

Input register, *continued*

Input register table,
cont.

Address	Description	Values /Units	Remarks
3x0013	Alarms (Word 1)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	- Dampers		
Bit1	- Fire dampers		
Bit2	-		
Bit3	- Supply fan		
Bit4	- Exhaust fan		
Bit5	- Fan operating hours		
Bit6	-		
Bit7	-		
Bit8	- Cooling		
Bit9	-		
Bit10	- Heating recovery		
Bit11	- Heating recovery pump		
Bit12	- Heating recovery frost		
Bit13	- Heating recovery efficiency		
Bit14	- Heating recovery damper		
Bit15	-		
3x0014	Alarms (Word 2)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	- Heating pump		
Bit1	- Heating frost		
Bit2	- Electrical heating		
Bit3	-		
Bit4	- Extra cooling (2)		
Bit5	-		
Bit6	- Extra heating (2)		
Bit7	- Extra heating (2) frost		
Bit8	- Extra electrical heating (2)		
Bit9	-		
Bit10	- Humidity pump		
Bit11	- Humidity command		
Bit12	-		
Bit13	- Fire alarm		
Bit14	-		
Bit15	- Filter alarm		
3x0015	Alarms (Word 3)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	- Out temperature		
Bit1	- Supply temperature		
Bit2	- Heating frost temperature		
Bit3	- Room1 temperature		
Bit4	- Room2 temperature		
Bit5	- Exhaust temperature		
Bit6	- Extract temperature		
Bit7	- Heating recovery supply temperature		
Bit8	- Heating recovery water temperature		
Bit9	- Extra supply temperature (2)		
Bit10	- Extra heating (2) frost temperature		
Bit11	- Auxiliary temperature		
Bit12	-		
Bit13	- Roomunits		
Bit14	- Supply temperature deviation		
Bit15	- Room/Exhaust temperature deviation		

Input register, *continued*

Input register table,
cont.

Address	Description	Values /Units	Remarks
3x0016	Alarms (Word 4)	0-65535	0-1 for each bit or counted binary to a decimal number
Bit0	- Supply pressure/flow and deviation		
Bit1	- Exhaust pressflow and deviation		
Bit2	-		
Bit3	- Outside humidity		
Bit4	- Supply humidity and deviation		
Bit5	- Room humidity and deviation		
Bit6	- Dewpoint		
Bit7	-		
Bit8	- Air quality		
Bit9	- External setpoint		
Bit10	- Auxiliary alarm		
Bit11	-		
Bit12	- Manual control		
Bit13	-		
Bit14	- Communication test		
Bit15	- Modbus master		
Present value, Unsigned Word			
3x0017	Actual operating mode 0=Off 1=On/Comfort 2=Economy 3=Na 4=Osstp 5=Nightcooling 6=Unoccupied (Temperature start) 7=Nightkick (Test temperature) 8=Firedamper test 9=Fire 10=Stop 11=Overrun 12=Startup	0-12	Off*On/Comfort*Economy*Na*Osstp *Nightcooling*Unoccupied (Temperature start)*Nightkick (Test temperature)*Firedamper test*Fire*Stop*Overrun*Startup
3x0018	Actual fan step	0-3	Off*Stage1*Stage2*Stage3
3x0019	Manual operation (steps)	0-4	Auto*Off*Stage 1*Stage 2*Stage 3
3x0020	Manual operation (steps/temperature)	0-7	Auto*Off*Eco St1*Comf St1*Eco St2*Comf St2*Eco St3*Comf St3
			Only one of Manual operation is used depending on configuration
3x0021	Actual time switch program (steps)	0-3	Off*Stage1*Stage2*Stage3
3x0022	Actual time switch program (steps/temperature)	0-7	Off*Eco St1*Comf St1*Eco St2*Comf St2*Eco St3*Comf St3
			Only one of TSP is used depending on configuration
3x0023	Actual Opmode ext ctrl	0-4	Auto*Off*Stage 1*Stage 2*Stage 3
3x0024	Fire damper state	0-2	NotDefined*Closed*Moving*Opened

Input register, *continued*

Input register table,
cont.

Address	Description	Values /Units	Remarks
3x0025	Outside air damper command	0-1	Off*On
3x0026	Extract air damper command	0-1	Off*On
3x0027	Fire damper command	0-1	Off*On
3x0028	Supply fan command	0-3	Off*Stage1*Stage2*Stage3
3x0029	Supply fan output signal	0 - 100%	
3x0030	Exhaust fan command	0-4	Off*Stage1*Stage2*Stage3
3x0031	Exhaust fan output signal	0 - 100%	
3x0033	Cooling output signal	0 - 100%	
3x0034	Cooling pump command	0-1	Off*On
3x0035	Cooling DX command	0-3	Off*Stage1*Stage2*Stage3
3x0036	Heat recovery output signal	0 - 100%	
3x0037	Heat recovery (pump) command	0-1	Off*On
3x0038	Heat recovery damper output signal	0 - 100%	
3x0039	Heat recovery damper recovery value	0 - 100%	
3x0040	Heating output signal	0 - 100%	
3x0041	Heating pump command	0-1	Off*On
3x0042	Electrical heating output signal	0 - 100%	
3x0043	Electrical heating command	0-3	Off*Stage1*Stage2*Stage3
3x0044	Cooling 2 output signal	0 - 100%	
3x0045	Cooling 2 pump command	0-1	Off*On
3x0046	Cooling 2 DX command	0-3	Off*Stage1*Stage2*Stage3
3x0047	Heating 2 output signal	0 - 100%	
3x0048	Heating 2 pump command	0-1	Off*On
3x0049	Electrical heating 2 output signal	0 - 100%	
3x0050	Electrical heating 2 command	0-3	Off*Stage1*Stage2*Stage3
3x0052	Humidifier output signal	0 - 100%	
3x0053	Humidifier command	0-1	Off*On
3x0054	Humidifier pump command	0-1	Off*On
3x0055	Actual dehumidity value	0 - 100%	
3x0057	Auxiliary operation mode output	0-1	Off*On
3x0058	Auxiliary time switch program output	0-1	Off*On
3x0059	Auxiliary analog output fan	0 - 100%	
3x0060	Alarm output 1	0-1	Normal*Alarm
3x0061	Alarm output 2	0-1	Normal*Alarm
3x0064	Actual airquality comp	0 - 100%	
3x0065	Actual fan cooling value	0 - 100%	
3x0066	Actual fan heating value	0 - 100%	
3x0067	Actual fan comp temperature	0 - 100%	
3x0068	Actual fan comp hum	0 - 100%	
3x0069	Actual summer comp fan	0 - 100%	
3x0070	Actual winter comp fan	0 - 100%	

Input register, *continued*

Input register table,
cont.

Address	Description	Values /Units	Remarks
Present value, Signed Word			
3x0072	Outside air temperature	-x.y - +x.y °C	(factor 10)
3x0073	Supply air temperature	-x.y - +x.y °C	(factor 10)
3x0074	Heating frost temperature	-x.y - +x.y °C	(factor 10)
3x0075	Actual room temperature	-x.y - +x.y °C	(factor 10)
3x0076	Exhaust air temperature	-x.y - +x.y °C	(factor 10)
3x0077	Extract air temperature	-x.y - +x.y °C	(factor 10)
3x0078	Heat recovery supply air temp	-x.y - +x.y °C	(factor 10)
3x0079	Heat recovery water temperature	-x.y - +x.y °C	(factor 10)
3x0080	Supply air temperature 2	-x.y - +x.y °C	(factor 10)
3x0081	Heating 2 frost temperature	-x.y - +x.y °C	(factor 10)
3x0082	Auxiliary temperature	-x.y - +x.y °C	(factor 10)
3x0084	Outside air hum relative	0 - x %rH	
3x0085	Outside air hum absolute	-x.y - +x.y g/kg	(factor 10)
3x0086	Outside air enthalpy	-x.y - +x.y kJ/kg	(factor 10)
3x0087	Supply air hum relative	0 - x %rH	
3x0088	Supply air hum absolute	-x.y - +x.y g/kg	(factor 10)
3x0089	Supply air enthalpy	-x.y - +x.y kJ/kg	(factor 10)
3x0090	Room humidity relative	0 - x %rH	
3x0091	Room humidity absolute	-x.y - +x.y g/kg	(factor 10)
3x0092	Room enthalpy	-x.y - +x.y kJ/kg	(factor 10)
3x0093	Dew point	-x.y - +x.y °C	(factor 10)
3x0095	Supply air flow	0 - x l/s	
3x0096	Exhaust air flow	0 - x l/s	
3x0097	Supply air pressure	0 - x Pa	
3x0098	Exhaust air pressure	0 - x Pa	
3x0099	Heat recovery frost pressure	0 - x Pa	
3x0101	Air quality	0 - x ppm	
3x0102	External setpoint	-x.y - +x.y °C	(factor 10)
3x0104	Actual heating setpoint, Main (depending on actual controlmode)	-x.y - +x.y °C	(factor 10)
3x0105	Actual cooling setpoint, Main (depending on actual controlmode)	-x.y - +x.y °C	(factor 10)
3x0106	Actual supply heating setpoint (when use of cascade control)	-x.y - +x.y °C	(factor 10)
3x0107	Actual supply cooling setpoint (when use of cascade control)	-x.y - +x.y °C	(factor 10)
3x0108	Actual humidity setpoint, Main (depending on actual controlmode)	x.y - x.y	(factor 10) %r.H. or g/kg
3x0109	Actual dehumidity setpoint, Main (depending on actual controlmode)	x.y - x.y	(factor 10) %r.H. or g/kg
3x0110	Actual supply humidity setpoint (when use of cascade control)	x.y - x.y	(factor 10) %r.H. or g/kg
3x0111	Actual supply dehumidity setpoint (when use of cascade control)	x.y - x.y	(factor 10) %r.H. or g/kg
3x0112	Actual Supply fan setpoint	0 - x	%, Pa or l/s
3x0113	Actual exhaust fan setpoint	0 - x	%, Pa or l/s

Input register, *continued*

Input register table,
cont.

Address	Description	Values /Units	Remarks
3x0115	Actual summer comp temperature	-x.y - +x.y °C	(factor 10)
3x0116	Actual winter comp temperature	-x.y - +x.y °C	(factor 10)
3x0117	Heat recovery efficiency	0 - 100%	
3x0118	Cooling recovery (MECH) active	0 - 1	Passive*Active
3x0120	Energy actual power	x.y - +x.y W	(factor 10)
3x0121	Energy average power	x.y - +x.y W	(factor 10)
3x0122	Energy operating hours	x.y - +x.y h	(factor 10)
3x0123	Energy partial	x.y - +x.y kWh	(factor 10)
3x0124	Energy total	x.y - +x.y kWh	(factor 10)

Only for Module, Onboard not supported

3x0200	Actual roomunit mode	0-4	Auto*Comfort*Standby* Economy*Off
3x0201	Actual roomunit setpoint	-x.y - +x.y K/°C	(factor 10)
3x0202	Roomunit 1 temperature	-x.y - +x.y °C	(factor 10)
3x0203	Roomunit 2 temperature	-x.y - +x.y °C	(factor 10)

3.5 Holding register

Holding register table

Address	Description	Values /Units	Remarks
Unsigned Word			
4x0001	Control bits	0-65535	
Bit0	- Emergency stop input		I/O
Bit1	- External control input 1		I/O
Bit2	- External control input 2		I/O
Bit3	- Su/Wi changeover input		I/O
Bit4	-		
Bit5	-		
Bit6	-		
Bit7	- Fire alarm input		I/O
Bit8	-		
Bit9	-		
Bit10	-		
Bit11	-		
Bit12	-		
Bit13	-		
Bit14	-		
Bit15	- Communicationtest puls		
Present value, Unsigned Word			
4x0005	BMS control/override time switch program (steps)	0-4	Auto*Off*Stage 1*Stage 2*Stage 3
4x0006	BMS control/override time switch program (steps/temperature)	0-7	Auto*Off*Eco St1*Comf St1*Eco St2*Comf St2*Eco St3*Comf St3
			Only one of BMS control is used depending on configuration
4x0007	Auxiliary BMS TSP output	0-2	Auto*Off*On
4x0008	Manual operation (steps)	0-4	Auto*Off*Stage 1*Stage 2*Stage 3
4x0009	Manual operation (steps/temperature)	0-7	Auto*Off*Eco St1*Comf St1*Eco St2*Comf St2*Eco St3*Comf St3
			Only one of Manual operation is used depending on configuration
4x0011	External control, off delay	0 - x h	
4x0012	External control, fan step	0-4	Auto*Off*1Step*2Step*3Step
4x0013	Roomunit presence time	0-23 h	
Present value, Signed Word			
4x0020	Comfort temperature setpoint	-x.y - +x.y °C	(factor 10)
4x0021	Comfort temperature deadzone	-x.y - +x.y °C	(factor 10)
4x0022	Comfort heating setpoint	-x.y - +x.y °C	(factor 10)
4x0023	Comfort cooling setpoint	-x.y - +x.y °C	(factor 10)
4x0024	Economy temperature setpoint	-x.y - +x.y °C	(factor 10)
4x0025	Economy temperature deadzone	-x.y - +x.y °C	(factor 10)
4x0026	Economy heating setpoint	-x.y - +x.y °C	(factor 10)
4x0027	Economy cooling setpoint	-x.y - +x.y °C	(factor 10)
			Different setpoint combinations are used depending on configuration
4x0028	Exhaust air temp setpoint 1, HOTC	-x.y - +x.y °C	(factor 10)
4x0029	Exhaust air temp setpoint 2, HOTC	-x.y - +x.y °C	(factor 10)
4x0030	Supply temp delta 1, HOTC	-x.y - +x.y °C	(factor 10)
4x0031	Supply temp delta 2, HOTC	-x.y - +x.y °C	(factor 10)
4x0032	Summer/winter changeover supply temp compensation	-x.y - +x.y °C	(factor 10)
4x0033	Extra Sequence setpoint	-x.y - +x.y °C	(factor 10)

Holding register, *continued*

Holding register table,
cont.

Address	Description	Values /Units	Remarks
4x0034	Supply temperature min setpoint (Pure room/exhaust control)	-x.y - +x.y °C	(factor 10)
4x0035	Supply temperature max setpoint (Pure room/exhaust control)	-x.y - +x.y °C	(factor 10)
4x0036	Supply temperature min setpoint (Cascade room/exhaust control)	-x.y - +x.y °C	(factor 10) Low limit
4x0037	Supply temperature max setpoint (Cascade room/exhaust control)	-x.y - +x.y °C	(factor 10) High limit
4x0039	Humidity setpoint relative	0 - x	%r.H. or g/kg
4x0040	Humidity deadz relative	0 - x	%r.H. or g/kg
4x0041	Humidity setpoint relative	0 - x	%r.H. or g/kg
4x0042	Dehumidity setpoint relative	0 - x	%r.H. or g/kg
4x0043	Humidity setpoint absolute	0 - x.y	(factor 10) %r.H. or g/kg depending on configuration
4x0044	Humidity deadz absolute	0 - x.y	(factor 10) %r.H. or g/kg
4x0045	Humidity setpoint absolute	0 - x.y	(factor 10) %r.H. or g/kg
4x0046	Dehumidity setpoint absolute	0 - x.y	(factor 10) %r.H. or g/kg
			Different setpoint combinations are used depending on configuration
4x0047	Supply humidity max setpoint (Pure room/exhaust control)	0 - x.y	(factor 10) %r.H. or g/kg
4x0048	Supply humidity min setpoint (Cascade room/exhaust control)	0 - x.y	(factor 10) %r.H. or g/kg
4x0049	Supply humidity max setpoint (Cascade room/exhaust control)	0 - x.y	(factor 10) %r.H. or g/kg
Present value, Unsigned Word			
4x0050	Supply fan step 1 setpoint	0 - x	%, Pa or l/s depending on configuration
4x0051	Supply fan step 2 setpoint	0 - x	%, Pa or l/s
4x0052	Supply fan step 3 setpoint	0 - x	%, Pa or l/s
4x0053	Supply fan max force setpoint	0 - x	%, Pa or l/s
4x0054	Exhaust fan step 1 setpoint	0 - x	%, Pa or l/s depending on configuration
4x0055	Exhaust fan step 2 setpoint	0 - x	%, Pa or l/s
4x0056	Exhaust fan step 3 setpoint	0 - x	%, Pa or l/s
4x0057	Exhaust fan max force setpoint	0 - x	%, Pa or l/s
Present value, Signed Word			
4x0059	Air quality setpoint	0 - x ppm	
Tracking value, Signed Word			
4x0060	Outside air temperature	-x.y - +x.y °C	(factor 10)
4x0061	Room humidity relative	0 -100 %r.H.	(factor 10)
4x0062	Room temperature	-x.y - +x.y °C	(factor 10)
4x0063	Room temperature 2	-x.y - +x.y °C	(factor 10)
4x0064	External setpoint	-x.y - +x.y °C	(factor 10)
Present value, Signed Word			
4x0070	Night cooling min out temp	-x.y - +x.y °C	(factor 10)
4x0071	Night cooling on delta	-x.y - +x.y °C	(factor 10)
4x0072	Night cooling room hysteresis	-x.y - +x.y °C	(factor 10)
4x0073	Night cooling room setpoint	-x.y - +x.y °C	(factor 10)

Holding register, *continued*

Holding register table,
cont.

Address	Description	Values /Units	Remarks
4x0074	Temp start heating start	-x.y - +x.y °C	(factor 10)
4x0075	Temp start heating setpoint	-x.y - +x.y °C	(factor 10)
4x0076	Temp start cooling start	-x.y - +x.y °C	(factor 10)
4x0077	Temp start cooling setpoint	-x.y - +x.y °C	(factor 10)
4x0078	Boost comp time	0 - x min	
4x0079	Boost room temp setpoint	-x.y - +x.y °C	(factor 10)
4x0080	Boost start heating	-x.y - +x.y °C	(factor 10)
4x0081	Boost start cooling	-x.y - +x.y °C	(factor 10)
4x0082	Draught cooling max deviation	-x.y - +x.y °C	(factor 10)
4x0083	Draught heating max deviation	-x.y - +x.y °C	(factor 10)
4x0084	Su compensation temp delta	-x.y - +x.y K	(factor 10)
4x0085	Wi compensation temp delta	-x.y - +x.y K	(factor 10)
4x0086	Cooling disable outside temp	-x.y - +x.y °C	(factor 10)
4x0087	Heat recovery frost setpoint	-x.y - +x.y °C	(factor 10)
4x0088	Heat recovery frost setpoint st1	-x.y - +x.y °C	(factor 10)
4x0089	Heat recovery frost setpoint st2	-x.y - +x.y °C	(factor 10)
4x0090	Max speed defrost	-x.y - +x.y %	(factor 10)
4x0091	Min fresh air	0 - 100%	
4x0092	Heating frost setpoint	-x.y - +x.y °C	(factor 10)
4x0093	Heating standby setpoint	-x.y - +x.y °C	(factor 10)
4x0094	Preheating outside temp X1	-x.y - +x.y °C	(factor 10)
4x0095	Preheating outside temp X2	-x.y - +x.y °C	(factor 10)
4x0096	Preheating pos Y1	0 - 100%	
4x0097	Preheating pos Y2	0 - 100%	
4x0098	Cooling 2 disable outside temp	-x.y - +x.y °C	(factor 10)
4x0099	Heating 2 frost setpoint	-x.y - +x.y °C	(factor 10)
4x0100	Heating 2 Standby setpoint	-x.y - +x.y °C	(factor 10)
4x0101	Preheating 2 outside temp X1	-x.y - +x.y °C	(factor 10)
4x0102	Preheating 2 outside temp X2	-x.y - +x.y °C	(factor 10)
4x0103	Preheating 2 pos Y1	0 - 100%	
4x0104	Preheating 2 pos Y2	0 - 100%	
4x0105	Dew point deadzone	-x.y - +x.y °C	(factor 10)
4x0106	Fan cooling deadzone	-x.y - +x.y °C	(factor 10)
4x0107	Fan heating deadzone	-x.y - +x.y °C	(factor 10)
4x0108	Fan compensation humidity	0 - x.y %rH	
4x0109	Fan compensation temperature	-x.y - +x.y °C	(factor 10)
4x0110	Fan slave offset	0 - x l/s	(factor 10)
4x0111	Max deviation supply temp	0 - x.y °C	(factor 10)
4x0112	Max deviation room temp	0 - x.y °C	(factor 10)
4x0113	Max deviation supply humidity	0 - x.y	(factor 10) %rH or g/kg depending on configuration
4x0114	Max deviation room humidity	0 - x.y	(factor 10) %rH or g/kg
4x0115	Max deviation supply fan	0 - x	%, Pa or l/s depending on configuration
4x0116	Max deviation exhaust fan	0 - x	%, Pa or l/s

Holding register, *continued*

Holding register table,
cont.

Address	Description	Values /Units	Remarks
Only for Module, Onboard not supported			
Loop and cascade controller settings			
	X Controller Gain	-x.yy - +x.yy	(factor 100), Signed Word
	X Controller Integral	0 - x sec	Unsigned Word
	X Controller Differential	0 - x sec	Unsigned Word
4x0201	Cooling	-x.yy - +x.yy	Gain
4x0202	Cooling	0 - x sec	Integral
4x0203	Cooling	0 - x sec	Differential
4x0204	Heat recovery	-x.yy - +x.yy	Gain
4x0205	Heat recovery	0 - x sec	Integral
4x0206	Heat recovery	0 - x sec	Differential
4x0207	Heat recovery frost protection	-x.yy - +x.yy	Gain
4x0208	Heat recovery frost protection	0 - x sec	Integral
4x0209	Heat recovery frost protection	0 - x sec	Differential
4x0210	Heat recovery frost pressure	-x.yy - +x.yy	Gain
4x0211	Heat recovery frost pressure	0 - x sec	Integral
4x0212	Heat recovery frost pressure	0 - x sec	Differential
4x0213	Heat recovery damper	-x.yy - +x.yy	Gain
4x0214	Heat recovery damper	0 - x sec	Integral
4x0215	Heat recovery damper	0 - x sec	Differential
4x0216	Heating	-x.yy - +x.yy	Gain
4x0217	Heating	0 - x sec	Integral
4x0218	Heating	0 - x sec	Differential
4x0219	Heating frost protection	-x.yy - +x.yy	Gain
4x0220	Heating frost protection	0 - x sec	Integral
4x0221	Heating frost protection	0 - x sec	Differential
4x0222	Electrical heating	-x.yy - +x.yy	Gain
4x0223	Electrical heating	0 - x sec	Integral
4x0224	Electrical heating	0 - x sec	Differential
4x0225	Cooling 2	-x.yy - +x.yy	Gain
4x0226	Cooling 2	0 - x sec	Integral
4x0227	Cooling 2	0 - x sec	Differential
4x0228	Heating 2	-x.yy - +x.yy	Gain
4x0229	Heating 2	0 - x sec	Integral
4x0230	Heating 2	0 - x sec	Differential
4x0231	Heating 2 frost protection	-x.yy - +x.yy	Gain
4x0232	Heating 2 frost protection	0 - x sec	Integral
4x0233	Heating 2 frost protection	0 - x sec	Differential
4x0234	Electrical Heating 2	-x.yy - +x.yy	Gain
4x0235	Electrical Heating 2	0 - x sec	Integral
4x0236	Electrical Heating 2	0 - x sec	Differential
4x0237	Min supply temperature	-x.yy - +x.yy	Gain
4x0238	Min supply temperature	0 - x sec	Integral
4x0239	Min supply temperature	0 - x sec	Differential
4x0240	Max supply temperature	-x.yy - +x.yy	Gain
4x0241	Max supply temperature	0 - x sec	Integral
4x0242	Max supply temperature	0 - x sec	Differential

Holding register, *continued*

Holding register table,
cont.

Address	Description	Values /Units	Remarks
Only for Module, Onboard not supported			
4x0243	Fan cooling	-x.yy - +x.yy	Gain
4x0244	Fan cooling	0 - x sec	Integral
4x0245	Fan cooling	0 - x sec	Differential
4x0246	Fan heating	-x.yy - +x.yy	Gain
4x0247	Fan heating	0 - x sec	Integral
4x0248	Fan heating	0 - x sec	Differential
4x0249	Fan compensation temperature	-x.yy - +x.yy	Gain
4x0250	Fan compensation temperature	0 - x sec	Integral
4x0251	Fan compensation temperature	0 - x sec	Differential
4x0252	Fan compensation humidity	-x.yy - +x.yy	Gain
4x0253	Fan compensation humidity	0 - x sec	Integral
4x0254	Fan compensation humidity	0 - x sec	Differential
4x0255	Supply fan	-x.yy - +x.yy	Gain
4x0256	Supply fan	0 - x sec	Integral
4x0257	Supply fan	0 - x sec	Differential
4x0258	Exhaust fan	-x.yy - +x.yy	Gain
4x0259	Exhaust fan	0 - x sec	Integral
4x0260	Exhaust fan	0 - x sec	Differential
4x0261	Humidification	-x.yy - +x.yy	Gain
4x0262	Humidification	0 - x sec	Integral
4x0263	Humidification	0 - x sec	Differential
4x0264	Max supply humidity	-x.yy - +x.yy	Gain
4x0265	Max supply humidity	0 - x sec	Integral
4x0266	Max supply humidty	0 - x sec	Differential
4x0267	Dehumidification	-x.yy - +x.yy	Gain
4x0268	Dehumidification	0 - x sec	Integral
4x0269	Dehumidification	0 - x sec	Differential
4x0270	Air quality	-x.yy - +x.yy	Gain
4x0271	Air quality	0 - x sec	Integral
4x0272	Air quality	0 - x sec	Differential
4x0273	Cascade controller temperature	-x.yy - +x.yy	Gain
4x0274	Cascade controller temperature	0 - x sec	Integral
4x0275	Cascade controller humidity	-x.yy - +x.yy	Gain
4x0276	Cascade controller humidity	0 - x sec	Integral

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Siemens Switzerland Ltd.
Building Technologies Group
International Headquarters
Gubelstrasse 22
CH-6301 Zug
Tel. +41 41-724 24 24
Fax +41 41-724 35 22
www.siemens.com/sbt

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