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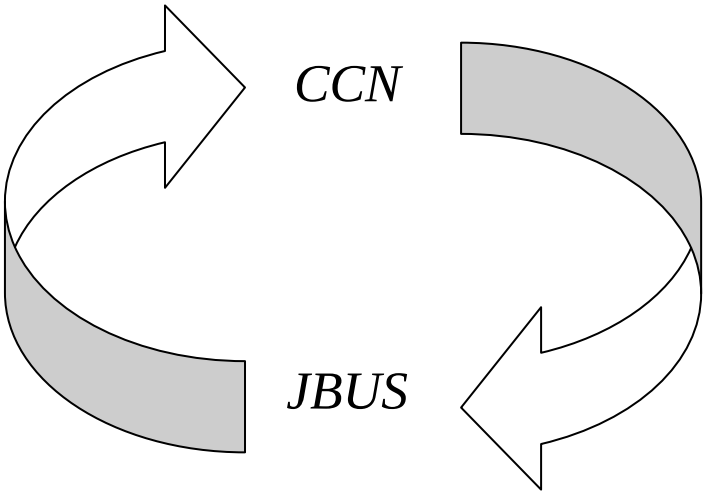
SPECIFICATION N°	ECG-UG-02-001
DATE	11/14/2002

OVERVIEW AND CONFIGURATION MANUAL

TITLE: CCN/JBUS GATEWAY LEI BASIC BOARD VERSION



REV : B

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CCN/J-BUS GATEWAY

OVERVIEW AND CONFIGURATION MANUAL

REVISION OF CHANGES		
REV LETTER	DESCRIPTION OF CHANGES	RELEASE DATE
B	Revision B	05/10/16
	• Correct hexadecimal registers adresses	
A	Revision A	08/30/05
	• Add the write multiple instance table functionality • Add table W_PT_INS • Add multiple instanced collection points (from 20 to 35) • Add tables INSTANC3 and INSTANC4 • Increase the number of instances to configure (from 100 to 128) • Add table 6XX_INS6 and 6XX_INS7 • Modify size of buffer Jbus from 2199 registers to 7771 registers, and add the registers for the write multiple instance table functionality. • Modify default value of Jbus order to 1 in table "GWY_INIT" • Add 2 Jbus register :135 and 136 for device CCN address.	
	Original Release	11/14/02

TABLE OF CONTENTS

1 INTRODUCTION

1.1 ABOUT THIS MANUAL

This manual contains information about the functions of the CCN/JBUS Gateway and how the user must configure the CCN/JBUS Gateway to perform those functions.

The manual is divided into the following sections:

- Introduction
- Hardware Description
- Operating Characteristics
- Configuration
- Maintenance
- Configuration Sheets
- Appendixes

The introduction section consists of this description of the manual together with an overview of the CCN/JBUS Gateway.

The Hardware Description section contains information for connecting the Gateway CCN and to the JBUS off-network.

The Operating Characteristics section contains a description of the Gateway, a description of how the Gateway operates and a summary description of its configuration.

The Configuration section begins with instructions for accessing, saving and downloading the Gateway configuration from a Building Supervisor or a Network Service Tool. These instructions are followed by detailed lists of the decisions for each Gateway configuration table. Each list entry includes the decision's purpose, the range of values that may be used, and the default values that will appear in the decision if not configured by the user.

The Maintenance section begins with instructions for accessing the Gateway maintenance tables. These instructions are followed by detailed lists of decisions for each table. Each list entry includes the decision's purpose and the range of values that may be displayed.

The appendixes section contains the JBUS memory mapping, a description of the Gateway alarms, an ASCII Strings to codes conversion table and a decimal to hexadecimal conversion table.

The Configuration Sheets section consists of a list of configuration decisions arranged in a table format. These sheets are provided so that they may be photocopied for use as worksheets and hard copy records when configuring the Gateway.

Manual sections 1, 2, 3.1 to 3.6, 4 and 5 are generally intended for use by the personal installing and configuring the Gateway.

Manual section 3.7 and appendix A are intended for use by the JBUS off-network user.

Note: in this manual, all values relative to data exchanged through the Gateway are provided both in decimal and hexadecimal format. Hexadecimal values are displayed into brackets.

1.2 INTRODUCTION TO THE CCN/JBUS GATEWAY

The CCN/JBUS Gateway is a microprocessor-based gateway that interfaces data exchange between one CCN controller and an off-network using JBUS protocol. The term *off- network* is used in this manual to refer to the JBUS Supervisor or PLC (automaton) connected to the Gateway.

A CCN/JBUS Gateway acts as a master/slave on the CCN network and acts as a slave on the JBUS network.

Each Gateway can interface one CCN controller. Several Gateways can be located on the same CCN network, each one polling one CCN device. This CCN device can be attached to multiple instanced elements. However, on larger CCN network a high amount of activity on the CCN bus, notably because of the data exchanges between the Gateway and their attached controller, can causes traffic conflicts. This can particularly occur when the Gateway polling rates have been set at a high level. In this case, modify (increase) the Gateway rates so as to reduce its activity on the network. An other option could be to use one or more secondary buses (through CCN bridges) as to reduce communications on the same bus. It is **highly recommended** never to load the bus at more than 30%.

The gateway allows to write on its attached CCN device. This writing should be used for locals writings and not for configuring all the attached device. Be also careful to the physicals characteristics of the local device attached:
Important example : If the gateway is attached to a system manager.
When modifying a variable on the system manager, it is written in EEPROM.
The EEPROM of the SM can be written 1,000,000 times on maximum. So if you write 1 variable every minute, The EEPROM will last **only 2 years**

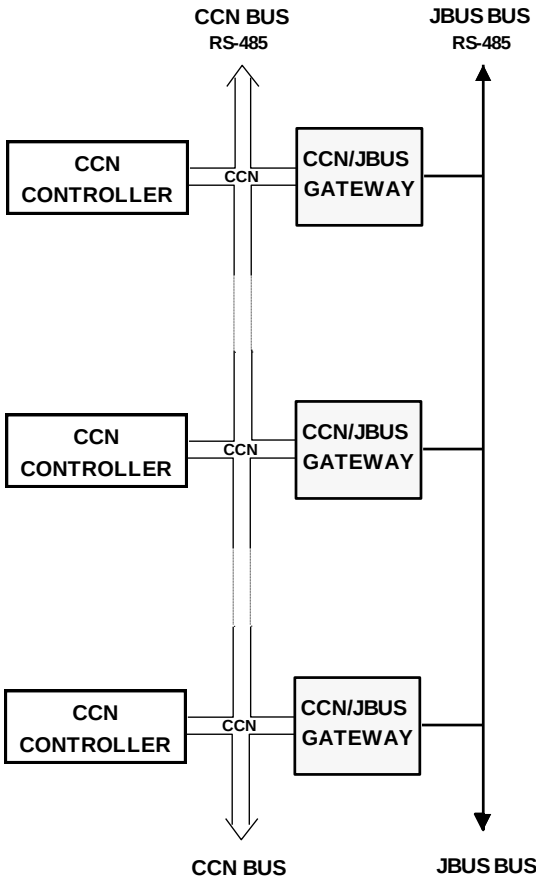


Figure 1
Example of CCN/JBUS Gateway Connection

All data that are exchanged between the JBUS master and its slave CCN controller are put into an allocation table, hereafter referred as the *Gateway Buffer*. The structure of this buffer, made up of 7772 registers of 2 bytes each, is fixed and cannot be modified. However, its contents depends on the controller that the Gateway interfaces and on Gateway configuration.

The Gateway can be configured to allow the following functions into the interfaced CCN controller:

- Reading of up to 40 points contained
- Reading of up to 15 alarm status
- Reading of up to 5 current alarm codes
- Writing of up to 12 setpoints
- Forcing of up to 10 variables (e.g. unit start/stop)
- Releasing of up to 5 variables.
- Reading of up to 35 instanced variables contained in up to 128 instance tables
- Writing of up to 8 instanced variables contained in up to 128 tables.

The range of control strategies that the transfer of information makes available to the off-network varies depending of the type of CCN controller connected to the Gateway.

In order to accomplish its duties, each Gateway contains a variety of tables for configuring the characteristics of the data exchange and displaying the activities of the system in operation.

Gateway configuration must be done through the CCN network, using either the Building Supervisor or a Network Service Tool.

1.3 SOFTWARE UPDATE

The Gateway module includes a LEI plug in board with specific EEPROM.

Only CCN/JBUS gateway software can be downloaded on the board when a new release is required.

The CCN/JBUS gateway can be downloaded using the downloader version 3.0 or later. Here is the example of the downloader list (download.lis) :

CESR208410-22	PD4 Global chiller GX & HXC SR 2.2	(1)
CESR208400-22	PD4 Recip chiller 30 GK & 30HZ V2 SR 2.2	(1)
CESR20DE00-20	LEI CCN JBUS PLUG IN BOARD SR 2.0	(1)

1. Software can be downloaded through CCN bus or through SIO bus
2. Software shall only be downloaded through SIO bus.
   Before downloading the software, use the reset command to erase the old software. Once F2 key is pressed, turn off and on quickly the power supply of the board, the message «Hard restart command successful !».
   Then go to the downloader , Select download, software and then press F2 to download the software as usual.

The «CESR20DE00-20» shall be used for the CCN/JBUS gateway.

2 HARDWARE DESCRIPTION

2.1 GENERAL

The LEI RS485 plug-in board consists of a microprocessor-based controller containing specialised software for its functions. The module includes an internal male header for plug-in interfacing with a LEI base board. It receives from the base board through the male header, power and CCN communications. It provides a three positions Phoenix connector for RS485 connection (used for JBUS communications) and LEDs for communications and board operations control.

This board does not have a cover and is not rated for outdoor use. It is recommended to install it with a LEI base board.

2.2 POWER SUPPLY

The LEI RS485 plug-in board is supplied by the LEI base board through connector JP1 between pins 1 and 2 (pin 3 is referred to earth) with 5VDC. Input to the LEI base board is connected with +/- 24 VAC incoming power that is modified in +5 VDC power.

2.3 BUS CONNECTION

Only one serial port is available on the board, a JBUS port located on the J1 connector. Pin 1 (+) provides the + JBUS signal and pin 3 (-) provides the – JBUS signal. Pin 2 is used for ground connection.
Serial channel is multidrops operation RS-485 differential. Bus connection between modules must be made through a three conductors shielded cable. Bus segment can be up to 1000 meters in length.

The CCN signal is provided by the base board through the male header plug. Pin 1 (+) provides the + CCN signal and pin 3 (-) provides the – CCN signal. The pin 2 is used for CCN ground connection.

RS-485 Signal Characteristics are compatible EIA Standard.

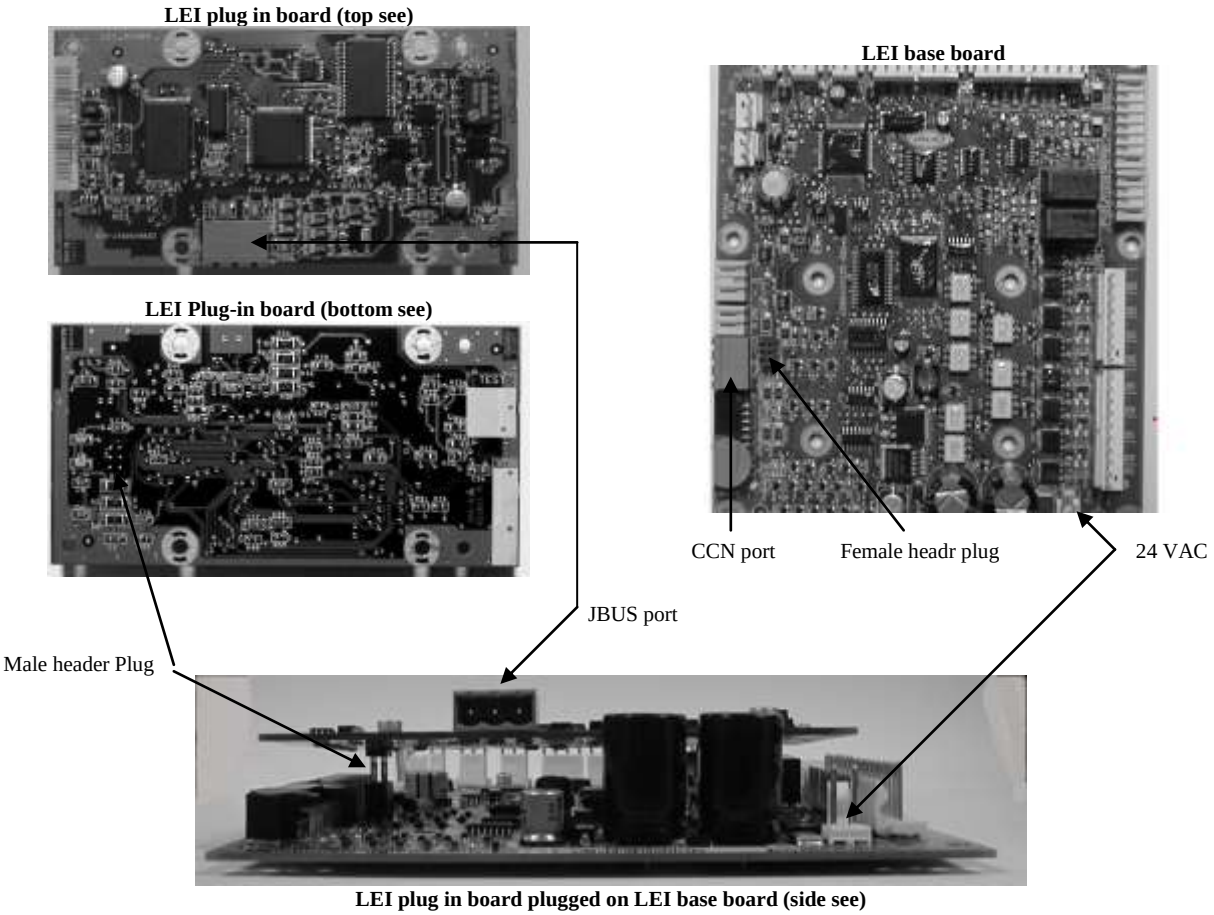
2.4 BOARD LEDS

The Gateway comprises 3 LEDs for operations control.

- The red LED, status of the board. This LED normally flashes at a 1 second rate to show that the board operates properly. This LED either permanently lit or flashing very strongly or very weakly indicates a faulty board. This LED permanently off indicates that the board power supply must be checked.
- The Yellow LED indicates, when flashing, communications on the CCN pins of plug.
- The green LED indicates, when flashing, communications on the JBUS bus.

Note: If the LEI RS485 plug-in board is not used with the LEI base board, it will need an adaptation board to provide power 5 VDC , and to interface the male header to a CCN connector.

Figure 2
CCN/JBUS Gateway
Connections



3 OPERATING DESCRIPTION

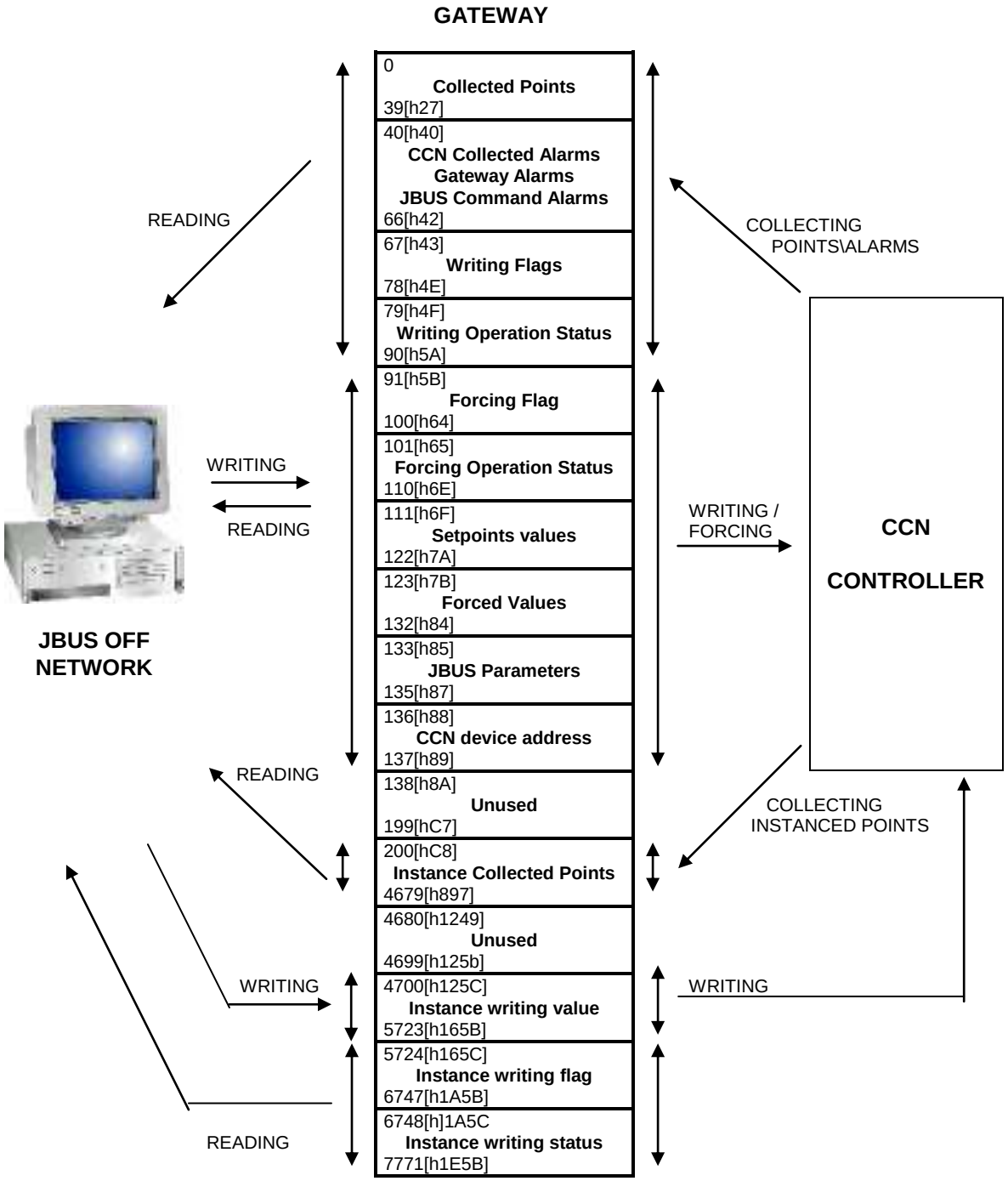
3.1 GENERAL

All data exchanged between the JBUS master and its slave CCN controller is done through a Gateway buffer. The Gateway buffer contains 7772 registers of 2 bytes each.

Gateway buffer is split into three parts:

- Part 1, ranges from register #0 to register #90. These registers are used for the storage of all values which are collected by the Gateway from its attached controller and which are provided for reading to the JBUS master. The JBUS off-network have no write access into this area.
- Part 2, ranges from register #91 to register #137 and register #4700 to register #5723 . These registers are read and write accessible by the JBUS off-network. When a JBUS write operation is detected into one of these registers, the Gateway operates, through the CCN network, a write, force or auto command into the controller it interfaces.
- Part 3, ranges from register #200 to register #4679 and from register #5724 to register #7771. These registers are used for the storage of all values which are collected by the gateway from multiple instanced elements of its attached controller. This values are provided for reading to the JBUS master. The JBUS off-network have no write access into this area.

Figure 3
Data Exchange
Through Gateway
Buffer



3.2 COLLECTING POINTS SEQUENCE DESCRIPTION

The Gateway collects points from the CCN controller it interfaces at the time intervals (Reading Update Rate) defined in the CCNCONF configuration table. Collected values are stored in the Gateway buffer registers where they are at the JBUS off-network reading disposal.

Points to be collected have to be configured in RPOINT1, RPOINT2, RPOINT3 or RPOINT4 CCN configuration tables (see CCN configuration section 4.7). Each point to be collected is linked to one register of the Gateway buffer where it is stored.

Depending on the type of the value, the following operation are applied:

- If the value is an integer then it is stored the same in its attached register.
- If the value is a float then it is multiplied by ten before being stored in its attached register.
- If the value is a float that have been forced to integer (through RPOINT configuration table by using the "!" command, see section 4.7) then point decimal digit is removed and the value is stored in its attached register. Negative value are stored as 0.
- If the value is an ASCII then its code relation is searched in the ASCII to codes database (see appendix D) and this code is then stored into its attached register.

The collected value type can be verified through the CCN Maintenance table REG_STAT. See section 5.4.

3.3 COLLECTING ALARMS SEQUENCE DESCRIPTION

The Gateway can be configured to collect alarms from the controller it interfaces. Three alarms collecting methods are available: Periodically collect, Event Triggered collect and read Point Name collect. These are described below.

Collected alarms are ranged in 3 sets of registers:

- One provides the total number of active alarms (integer value).
- A stack of 5 registers provides a code (integer value) of alarms active in the controller interfaced by the Gateway. Codes are stored in arrival order. Generally, alarms codes displayed in these registers fit the codes displayed through the unit local interface. Refer to the device CCN Overview and Configuration Manual for more information about codes.
- 15 registers containing binary values are available for configured alarms control. Each one of these register can be configured to be linked to one alarm code. If the alarm code is active then the register is set to 1. Otherwise it set to 0. This configuration is done through the Gateway R_ALARM CCN configuration table.

3.3.1 Alarms Periodically Collection

When this option is selected, collection of alarms is done sequentially at the time interval (Alarms Update Rate) defined in the CCNCONF configuration table.

3.3.2 Alarms Event Triggered Collection

When this option is selected, collection of alarms is done based on the value of a trigger point defined in the CCNCONF configuration table. Value of this trigger point is collected at the configured reading update rate. This triggering point is compared to a configured triggering parameter defined as "*No Alarms Trigger Value*". Until the collected triggering point value is equal to the triggering parameter, no alarm collection is done. If the comparison produces a result of true, alarms collection begins and will be repeated each time the configured Alarms Update Rate interval has elapsed. An alarms event triggered collection runs until the collected triggering point value is different from the triggering parameter.

In most of the CCN controllers, the triggering point is provided by the general alarm status point (ALM) which is included in a point display table.

Since this method allows to reduce the traffic due to alarm collection on the CCN network, it is hardly recommended to prefer it to the alarm periodically collection.

3.3.3 Alarms Read Point Name Collection

When this option is selected, collection of alarms is done based on table and variable names. Values of this variables are collected at the configured reading update rate. Points to be collected have to be configured in CCNCONF configuration tables (see CCN configuration section 4.7). Each point to be collected is linked to one register from 41 to 45 of the Gateway buffer where it is stored.

In most of the CCN controllers, the alarm points are provided by the current alarm 1 to 5 (alarm_1, …alarm_5).

3.4 WRITING/FORCING SEQUENCE DESCRIPTION

At the rate (Writing Update Rate) defined in the CCNCONF configuration table, the Gateway verifies that it has received a write command issued from the JBUS off-network. If yes, and if the consistency of the write command is correct, the Gateway sends the value to the CCN controller it interfaces.

Four types of writing operation can be executed with the Gateway:

- Changing the value of any setpoint contained in a Setpoint CCN table.
- Forcing (overriding the value or the status of) any specified CCN variable contained in a Point Display table (e.g. Chiller Start/Stop command). Refer to the particular system elements overview and configuration manual or CCN supplement for point names that are forcible.
- The force priority level for the Gateway is 5 (Monitor). The Gateway can only override forces that are less or equal to 5.
- Removing (auto) the current force on a CCN variable and return it to its actual value. The Gateway can auto any force level.

Note: access to points contained in table having multiple instance is not allowed.

About Force Priority:

Force Priority levels range from 0 to 8, with 0 being the highest force priority and 8 being the lowest priority. The force priority for the Gateway is level 5 (Monitor). The Gateway can only override forces that are less than or equal to Level 5.

CCN force levels are listed below:

Level	Force Abbreviation	Description
1	Fire	Fire Override
2	Safety	Internal Safety Override
3	Service	Service Tool
4	Supvsr	Building Supervisor
5	Monitor	Off-Site Building Supervisor
6	Min-Off	Loadshed Minimum Offtime
7	Control	Controlling System Software Option
8	BEST	BEST

Setpoints to be written have to be configured in WDEC CCN configuration table and variables to be forced or autoed have to be configured in FVAR CCN configuration table (see CCN configuration section 4.9).

Three Gateway registers are attached to each setpoint configured for writing and to each variable configured for forcing or releasing:

- First is loaded with the *setpoint or forcing value* received after a write command has been issued by the JBUS off-network.
- Second contains the *writing or forcing flag*. This flag is automatically set to 1 when a write command is issued by the JBUS off-network to the register described above. This flag set to 1

causes the Gateway to change the value of the setpoint in the CCN controller it interfaces. When the operation is achieved this flag returns to 0.

- Third contains the *writing or forcing operation status*:
  - 0 means that the writing or forcing operation has been correctly executed.
  - 1 means that the writing or the forcing access is denied on this point. Writing or Forcing function cannot be implemented.
  - 2 means that the writing or forcing operation has not been implemented because of a communication failure on the CCN network. Writing or forcing operation will be automatically retried at the Writing Update rate.
  - 3 means that the writing or forcing operation is in progress: off-network writing command has been detected and the Gateway is waiting for the next writing sequence (depending on the Writing Update Rate) to implement this command into the interfaced CCN controller.
  - -1 means that the point format is illegal. Writing or Forcing function cannot be implemented.

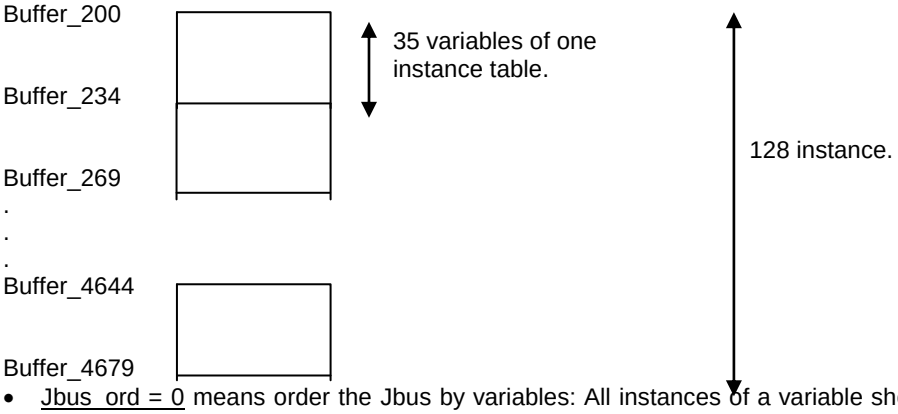
Note: if writing value sent by the off-network is outside of the range of the upper and lower limits defined for the point, the Gateway clamps the value to limits before executing the writing or forcing sequence.

3.5 COLLECTING INSTANCED POINTS SEQUENCE DESCRIPTION

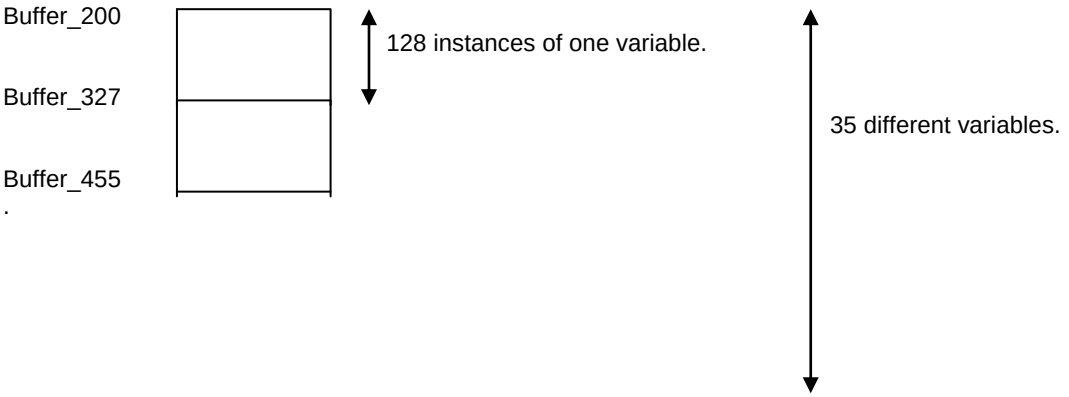
The Gateway collects points from multiple instanced elements of the CCN controller it interfaces with a minimum time interval (Read inst min wait time) defined in the CCNCONF configuration table. Instanced collected values are stored in the Gateway buffer registers where they are at the JBUS off-network reading disposal.

Instanced points to be collected have to be configured in INSTANCE, INSTANC2, INSTANC3 or INSTANC4 CCN configuration tables (see CCN configuration section 4.14). The instance elements selected to read the points have to be configured in 6XX_INS1, 6XX_INS2, …, 6XX_INS7 CCN configuration tables (see CCN configuration section 4.15). Each instance of point to be collected is linked to one register of the Gateway buffer where it is stored. The registers begin at address 200. There is two ways to link registers and instances.
One way to order the collected points is to change variable Jbus_ord in GWY_INIT CCN configuration table:

- Jbus_ord = 1 means order the Jbus by element: All variables of an element should be ordered next to the other.

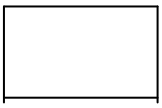


- Jbus_ord = 0 means order the Jbus by variables: All instances of a variable should be ordered next to the other



.
.
Buffer_4551

Buffer_4679



The second way to modify the order of the Jbus. When selecting instances to display in configuration tables 6XX_INS1 to 6XX_INS7, the user have to enter a number that is the selected instance. He enters it in front of a line of text: "Jbus ord XX, instance nb?" XX represents the order of the selected instance in the Jbus.

3.5.1 Example of multiple instance variable configuration.

3.5.1.1 choice of tables and variables

Tables and variables are chosen by entering their name in the tables called INSTANCE, INSTANC2, INSTANC3, INSTANC4.

In this example we have chosen three variables from three different tables:

Instance Point Name 01	TCZONE
Table Name	TCCONFIG
Instance Point Name 02	ZONESTPT
Table Name	ZNCONFIG
Instance Point Name 03	MONTH
Table Name	HOLIDAYS

3.5.1.2 choice of instances to read

Choice is made by entering the selected instance number in tables 6XX_INS1 to 6XX_INS7.

Variable TCZONE	has got 128 instances
Variable ZONESTPT	has got 32 instances
Variable MONTH	has got 6 instances

In this example we have decided to select all the instance points from 1 to 128, and to order them like that.

Instance 01 JBUS order	02
Instance 02 JBUS order	01
Instance 03 JBUS order	03
.	
.	
Instance 127 JBUS order	127
Instance 128 JBUS order	128

3.5.1.3 choice of Jbus order

Choice is made by entering the type of JBUS order in table GWY_INIT, variable Jbus_ord :

**********	
* Jbus order *	0/1
* by var name = 0 *	
* by element = 1 *	
**********	

3.5.1.3.1 by var name

With this option all instances of a variable are ordered next to the other.

If this option is chosen Jbus registers should be order like that

Buffer 00	Buffers not filled by instances tables
Buffer 199	
Buffer 200	TCZONE instance 2 value
Buffer 201	TCZONE instance 1 value
Buffer 202	TCZONE instance 3 value
…	…
Buffer 327	TCZONE instance 128 value
Buffer 328	ZONESTPT instance 2 value
Buffer 329	ZONESTPT instance 1 value
Buffer 330	ZONESTPT instance 3 value
…	…
Buffer 361	ZONESTPT instance32 value
Buffer 362	Empty (ZONESTPT instance 32 not defined)
…	…
Buffer 456	MONTH instance 2 value
Buffer 457	MONTH instance 1 value
Buffer 458	MONTH instance 3 value
…	…
Buffer 461	MONTH instance 6 value
Buffer 462	Empty (MONTH instance 7 not defined)
…	…
Buffer 584	Empty (no more variable defined)
…	…
Buffer 4679	Empty (no more variable defined)

3.5.1.3.2 by element

With this option all variables of an instance are ordered next to the other.
If this option is chosen Jbus registers should be order like that

Buffer 00	Buffers not filled by instances tables
Buffer 199	
Buffer 200	TCZONE instance 2 value
Buffer 201	ZONESTPT instance 2 value
Buffer 203	MONTH instance 2 value
Buffer 204	Empty (no more variables defined for this instance)
…	…
Buffer 235	TCZONE instance 1 value
Buffer 236	ZONESTPT instance 1 value
Buffer 237	MONTH instance 1 value
Buffer 238	Empty (no more variables defined for this instance)
…	…
Buffer 270	TCZONE instance 3 value
Buffer 271	ZONESTPT instance 3 value
Buffer 272	MONTH instance 3 value
Buffer 273	Empty (no more variables defined for this instance)
…	…
Buffer 410	TCZONE instance 7 value
Buffer 411	ZONESTPT instance 7 value
Buffer 412	Empty (MONTH instance 7 not defined)
Buffer 423	Empty (no more variables defined for this instance)
…	…
…	…
Buffer 1285	TCZONE instance 32 value
Buffer 1286	ZONESTPT instance 32 value
Buffer 1287	Empty (MONTH instance 32 not defined)
Buffer 1288	Empty (no more variables defined for this instance)
…	…
Buffer 1320	TCZONE instance 33 value
Buffer 1321	Empty (ZONESTPT instance 33 not defined)
Buffer 1322	Empty (MONTH instance 33 not defined)
Buffer 1323	Empty (no more variables defined for this instance)
…	…
Buffer 1355	TCZONE instance 34 value
Buffer 1356	Empty (ZONESTPT instance 34 not defined)
Buffer 1357	Empty (MONTH instance 34 not defined)
Buffer 1358	Empty (no more variables defined for this instance)
…	…
Buffer 4645	TCZONE instance 128 value
Buffer 4646	Empty (ZONESTPT instance 128 not defined)
Buffer 4647	Empty (MONTH instance 128 not defined)
Buffer 4648	Empty (no more variables defined for this instance)
…	…
Buffer 4679	Empty (no more variables defined for this instance)

Depending on the type of the value, the following operation are applied:

- If the value is an integer then it is stored the same in its attached register.
- If the value is a float then it is multiplied by ten before being stored in its attached register.
- If the value is a float that have been forced to integer (through INSTANCE configuration table by using the "!" command, see section 4.7) then point decimal digit is removed and the value is stored in its attached register. Negative value are stored as 0.
- If the value is an ASCII then its code relation is searched in the ASCII to codes database (see appendix D) and this code is then stored into its attached register.

The collected value type can be verified through the CCN Maintenance table REG_STAT. See section 5.4.

Note: access to points contained in table having multiple instance is not allowed.

3.6 WRITING INSTANCED POINTS SEQUENCE DESCRIPTION

The Gateway verifies that it has received a write command issued from the JBUS off-network with a minimum time interval (write inst min time) defined in the CCNCONF configuration table. If yes, and if the consistency of the write command is correct, the Gateway sends the value to the CCN controller it interfaces.

Instanced points to be written have to be configured in W_PT_INS CCN configuration tables (see CCN configuration section 4.16). The instances of the points to write **can not be configured**.

Three Gateway registers are attached to each instance of point configured for writing:

- First is loaded with the *setpoint value* received after a write command has been issued by the JBUS off-network.
- Second contains the *writing flag*. This flag is automatically set to 1 when a write command is issued by the JBUS off-network to the register described above. This flag set to 1 causes the Gateway to change the value of the setpoint in the CCN controller it interfaces. When the operation is achieved this flag returns to 0.
- Third contains the *writing operation status*:
  - 0 means that the writing or forcing operation has been correctly executed.
  - 1 means that the writing or the forcing access is denied on this point. Writing or Forcing function cannot be implemented.
  - 2 means that the writing or forcing operation has not been implemented because of a communication failure on the CCN network. Writing or forcing operation will be automatically retried at the Writing Update rate.
  - 3 means that the writing or forcing operation is in progress: off-network writing command has been detected and the Gateway is waiting for the next writing sequence (depending on the Writing Update Rate) to implement this command into the interfaced CCN controller.
  - -1 means that the point format is illegal. Writing or Forcing function cannot be implemented.

Note: if writing value sent by the off-network is outside of the range of the upper and lower limits defined for the point, the Gateway clamps the value to limits before executing the writing or forcing sequence.

Writing instanced points jbus registers description:

The jbus registers order for this part **is not linked** to tables 6XX_INS and **can not be modified**.:
Configuration example :

1°) W_PT_INS configuration:

Write inst Point Name 01	ZONESTPT
Table Name 01	ZNCONFIG
Write inst Point Name 02	UNOCCDB
Table Name 02	ZNCONFIG
Write inst Point Name 03	OCCDB
Table Name 03	ZNCONFIG
…	
Write inst Point Name 08	ZNOCCSEL

Table Name 08 ZSCONFIG

2°)writing instance Jbus register order

	Register Nb	General variable	Example variables
Instance writing value	4700	Instance 1 variable 1	instance 1 of ZONESTPT ZNCONFIG
	4701	Instance 1 variable 2	instance 1 of UNOCCDB ZNCONFIG
	4702	Instance 1 variable 3	instance 1 of OCCDB ZNCONFIG
	…	…	…
	4707	Instance 1 variable 8	instance 1 of ZNOCCSEL ZSCONFIG
	4708	Instance 2 variable 1	instance 2 of ZONESTPT ZNCONFIG
	4709	Instance 2 variable 2	instance 2 of UNOCCDB ZNCONFIG
	…	…	…
	4715	Instance 2 variable 8	instance 2 of ZNOCCSEL ZSCONFIG
	…	…	…
	4908	Instance 26 variable 1	instance 26 of ZONESTPT ZNCONFIG
	4909	Instance 26 variable 2	instance 26 of UNOCCDB ZNCONFIG
	…	…	…
	4915	Instance 26 variable 8	instance 26 of ZNOCCSEL ZSCONFIG
	…	…	…
	5716	Instance 128 variable 1	instance 128 of ZONESTPT ZNCONFIG
	5717	Instance 128 variable 2	instance 128 of UNOCCDB ZNCONFIG
	…	…	…
	5723	Instance 128 variable 8	instance 128 of ZNOCCSEL ZSCONFIG
Instance writing flag	5724	Instance 1 variable 1	instance 1 of ZONESTPT ZNCONFIG
	5725	Instance 1 variable 2	instance 1 of UNOCCDB ZNCONFIG
	…	….	…
	5731	Instance 1 variable 8	instance 1 of ZNOCCSEL ZSCONFIG
	5732	Instance 2 variable 1	instance 2 of ZONESTPT ZNCONFIG
	5733	Instance 2 variable 2	instance 2 of UNOCCDB ZNCONFIG
	…	…	…
	5739	Instance 2 variable 8	instance 2 of ZNOCCSEL ZSCONFIG
	…	…	…
	6740	Instance 128 variable 1	instance 128 of ZONESTPT ZNCONFIG
	6741	Instance 128 variable 2	instance 128 of UNOCCDB ZNCONFIG
	…	…	…
	6747	Instance 128 variable 8	instance 128 of ZNOCCSEL ZSCONFIG
Instance writing status	6748	Instance 1 variable 1	instance 1 of ZONESTPT ZNCONFIG
	6749	Instance 1 variable 2	instance 1 of UNOCCDB ZNCONFIG
	…	…	…
	6755	Instance 1 variable 8	instance 1 of ZNOCCSEL ZSCONFIG
	6756	Instance 2 variable 1	instance 2 of ZONESTPT ZNCONFIG
	6757	Instance 2 variable 2	instance 2 of UNOCCDB ZNCONFIG
	…	…	…
	6763	Instance 2 variable 8	instance 2 of ZNOCCSEL ZSCONFIG
	…	…	…
	7764	Instance 128 variable 1	instance 128 of ZONESTPT ZNCONFIG
	7765	Instance 128 variable 2	instance 128 of UNOCCDB ZNCONFIG
	…	…	…
	7771	Instance 128 variable 8	instance 128 of ZNOCCSEL ZSCONFIG

Important : Don't forget that if The gateway is attached to a System manager, the Number variables writing should be limited to 1,000,000 (see section 1.2). Modifying all variables' instances means writing 1024 (=8*128) times in the SM. So Only write variables when needed and never use an automatic procedure that would write periodically SM variables.

3.7 CCN FUNCTIONS

3.7.1 Communication Parameters

The CCN communication bus, which uses RS-485 signaling, operates at 1200, 2400, 4800 or 9600 bits per second. It typically operates at 9600 bauds. The Gateway default system numbers are Bus 0 and System Element 135. The CCN operating rate and the system element number can be modified through the Network Service Tool.

3.7.2 Initialisation

The Gateway runs an initialisation sequence each time the power is applied to the board or each time an initialisation sequence is required through the CCN table GWY_INIT.

(1) Initialisation operates the following steps:

- During 1.5 minutes, after the initiation of the initialisation sequence, the Gateway is in standby. During this time no operation is done. Possibly, this allows the controller interfaced by the Gateway to achieve its initialisation before the Gateway starts its own sequence.
- The Gateway runs its initialisation routine. During this sequence, the Gateway configuration is verified, the type, unit and range of points that have been configured are controlled.
- If the initialisation routine fails because of communication errors due to high traffic on the CCN network then it is stopped for 3 minutes. When this delay is elapsed, the initialisation restarts automatically at the failed point. This sequence can be repeated until the Gateway has achieved its initialisation.
- If the initialisation routine fails because of a Gateway configuration error then the initialisation is immediately and definitively stopped. Initialisation must be run again after the Gateway configuration has been modified.

(2) Initialisation with default configuration upload. When enable, the gateway will upload default configuration from attached device before going to sequence (1). The default configuration sequence can be launched from Jbus by modifying the registers 135 and 136 (attached device CCN address).

Note: the CCN Maintenance table UPDATE allows to follow each step of an initialisation sequence.

3.7.3 Gateway Alarms

Two types of Gateway alarms are available:

- Initialisation sequence alarms. These allow to detect all incorrect point name or table name that have been set up in the Gateway CCN configuration tables. *Incorrect* must be understood as wrongly spelt point or table name, or a point or a table name which is unknown in the interfaced controller. Alarm Gateway provides a codes allowing to easily found the cause of the configuration mistake.

- Operation alarms. These allow to detect CCN communication errors or incorrect JBUS commands.

See in Appendix B the complete description of the Gateway alarms.

3.8 JBUS FUNCTIONS

3.8.1 Communication Parameters

The JBUS communication bus, which uses RS-485 signaling, operates at 300, 600, 1200, 2400, 4800, 9600, 19200 or 38400 bits per second. By default, it operates at 9600 bauds. The Gateway JBUS slave address can take any value between 1 and 255. The default JBUS Gateway address is 1. The JBUS operating rate and the JBUS address can be modified either through the CCN network, by using the Building Supervisor or the Network Service Tool, or either through the JBUS network. When modified, these new communication parameters will be only effective after a Gateway initialisation. On the contrary, modification of these JBUS communication parameters will be immediately active if they are implemented through the JBUS port.

To modify the JBUS communication parameters through the JBUS port:

- Operates a write command on register 133 [h85] for modifying the JBUS baud rate.
  - 300 bauds [h12C]
  - 600 bauds [h258]
  - 1200 bauds [h4B0]
  - 2400 bauds [h960]
  - 4800 bauds [h12C0]
  - 9600 bauds [h2580] (default value)
  - 19200 bauds [h4B00]
  - 38400 bauds [h9600]

- Operates a write command on register 134 [h86] for modifying the JBUS address.
  - Value between 1 [h1] and 255 [hFF] (default value = 1)

- Operates a write command on register 135 [h87] for modifying the JBUS parity type.
  - 0 : No parity 1 stop bit
  - 1 : Odd parity 1 stop bit
  - 2 : Even parity 1 stop bit
  - 3 : No parity 2 stop bit
  - 4 : Odd parity 2 stop bit
  - 5 : Even parity 2 stop bit

See section 4.6 for the description of the modification of the JBUS communication parameters through the CCN network.

Note: if an incorrect address or baud rate is entered, it will be rejected and the Gateway will use the default values.

Maximum response time to complete a JBUS transaction: 700 ms (time out).

3.8.2 JBUS Frame

3.8.2.1 General

All communications on the JBUS port are done in the Remote Terminal Unit (RTU) mode, called also binary.
Data have the following frame (binary):

- 8 data bits

Parity and Stop bit (new function)

Parity and stop bit can be selected on this version unlike the old version which was fix (no parity and 1 stop bit). Default setting is no parity and 1 stop bit. These parameters can be modified either through the CCN network, by using the Building Supervisor or the Network Service Tool, or either through the JBUS network. When modified, these new communication parameters will be only effective after a Gateway initialisation. On the contrary, modification of these JBUS communication parameters will be immediately active if they are implemented through the JBUS port.
To modify the JBUS communication parity and stop bit through the JBUS port:

- Operates a write command on register 135 [h72] for modifying the JBUS parity.
  - 0 : no parity 1 stop bit (default value)
  - 1 : Odd parity 1 stop bit
  - 2 : Even parity 1 stop bit
  - 3 : No parity 2 stop bit
  - 4 : Odd parity 2 stop bit
  - 5 : Even parity 2 stop bit

3.8.2.2 Reading

Format of data received by the JBUS off-network from the Gateway depends of the CCN Point Type.

- An unsigned integer point will be received as a 2 bytes unsigned by the JBUS off-network.
- A float point will be received as a 2 bytes signed by the JBUS off-network. This data must be divided by 10 when received by the off-network. If negative, it must be two's complemented.
- A float point that have been forced to integer through RPOINT table configuration, by using the "!" command (see configuration section 4.7), will be received as a 2 bytes unsigned by the JBUS off-network. A negative value will be forced to 0.
- An ASCII point will be received as a 2 bytes unsigned code by the JBUS off-network. Relation between ASCII strings and codes is provided by table in appendix D.

Note: all values received by the JBUS off-network are **in metric** units.

Data example:

- Point Type: Unsigned Integer
  A 41157 decimal value will be received as [hA2B9] by the JBUS off-network.

- Point Type: Float
  A -372.5 decimal value will be received as [hF173] by the JBUS off-network. Since this value is multiplied by 10 before being stored into exchange buffer, it must be divided by 10 before being used by the JBUS off-network.

- Point Type: Float forced to integer
  A 41157.5 decimal value will be received as [hA2B9] by the JBUS off-network. This value must not be divided by 10 before being used by the JBUS off-network.
  A -41157.5 decimal value will be received as [h0] by the JBUS off-network.

- Point Type: ASCII

A "Stopping" ASCII value will be received as [h1D] (29 decimal) by the JBUS off-network (see ASCII to codes conversion table in appendix D).

3.8.2.3 Writing

Format of data sent (writing JBUS command) by the JBUS off-network to the Gateway depends on the CCN Point Type.

- Unsigned integer point must be sent as 2 bytes unsigned by the JBUS off-network.
- Float point must be sent as 2 bytes signed by the JBUS off-network. This data must be multiplied by 10 before being sent to the Gateway. If negative, it must be two's complemented.

Note: all values sent by the JBUS off-network to the Gateway must be in **metric** units.

Data example:

- Point Type: Unsigned Integer
  A 41157 decimal value must be sent as [hA2B9] by the JBUS off-network to the Gateway.

- Point Type: Float
  A -372.5 decimal value must be sent as [hF173] by the JBUS off-network.

3.8.3 JBUS Commands

The following JBUS commands are available:

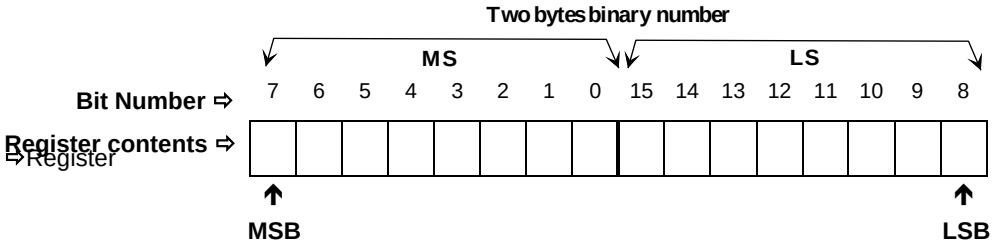
- Function 1 or 2 : Reading of 1 to 1024 bits in the range 0 to 1824
- Function 3 or 4 : Reading of 1 to 2200 registers in the range 0 to 7771
- Function 5 : Writing of 1 bit in the range 1392 to 1824
- Function 6 : Writing of 1 register in the range 91 to 135 and 4700 to 5723.
- Function 15 : Writing of 1 to 432 bits in the range 1392 to 1824
- Function 16 : Writing of 1 to 27 registers in the range 91 to 135 and 4700 to 5723.

Since data is stored in a whole register, Function 3 or 4 and 16 are recommended.

3.8.4 JBUS Memory Mapping

The Gateway uses 7772 registers of 2 bytes each for its exchange of data with a JBUS off-network. Since all address references in a JBUS message are numbered relative to 0, register are numbered from 0 to 7771.

Register bits are numbered in the following order:



Then, the address of the Least Significant Bit (LSB) of a register will be provided by the following formula:

Decimal Register LSB Address = (Register number) x 16 + 8

Hexadecimal [h Register LSB Address] = [h Register number] x [h10] + [h8]

Registers ranging from 0 to 7771 are JBUS read accessible. Registers ranging from 91 to 100, from 111 to 135 and from 4700 to 5723 are JBUS write accessible.

Table in Appendix A provides a complete description of the Gateway registers.

4 CONFIGURATION DESCRIPTION

4.1 GENERAL

The operations of the CCN/JBUS Gateway is controlled by decisions entered in a group of configuration tables. Each gateway contains the following configuration tables:

- Ctrl-ID Controller Identification Table
- CCNCONF CCN port Configuration Table
- JBUSCONF JBUS Port Configuration Table
- RPOINT1 Read Points Configuration Table
- RPOINT2 Read Points Configuration Table
- RPOINT3 Read Points Configuration Table
- RPOINT4 Read Points Configuration Table
- WDEC Write Decisions Configuration Table
- FVAR Force Variables Configuration Table
- R_ALARM Read Alarms Configuration Table
- REG_CONF Register to Display Configuration Table
- GWY_INIT Initialisation Table
- STRG_DEF User strings Configuration Table
- INSTANCE Read Instanced Points configuration table
- INSTANC2 Read Instanced Points configuration table
- INSTANC3 Read Instanced Points configuration table
- INSTANC4 Read Instanced Points configuration table
- W_PT_INS Write Instanced points configuration table
- 6XX_INS1 Choose instances Configuration table
- 6XX_INS2 Choose instances Configuration table
- 6XX_INS3 Choose instances Configuration table
- 6XX_INS4 Choose instances Configuration table
- 6XX_INS5 Choose instances Configuration table
- 6XX_INS6 Choose instances Configuration table
- 6XX_INS7 Choose instances Configuration table

4.2 AUTO CONFIGURATION

The auto configuration sequence is launched automatically when the board is not configured. By default the board try to read the configuration parameters of the device attached at CCN address (0,1). The board will reboot as long as it as not been able to communicate with the device (0,1).
The CCN address of the device to attach can be changed by writing Jbus registers 136 and 137 (device bus nb and element nb). When theses registers have been written, the auto configuration sequence is launched again.

Warning : writing the jbus register may require many tries if the board tries to attach to an unexisting device at address (0,1). Actually the board will reboot trying to communicate with device (0,1).

4.3 ACCESSING CONFIGURATION TABLES

To access a CCN/JBUS Gateway configuration table from a Building Supervisor or a Network Service Tool:

1. Select the *Controls* function.
2. Select the menu item *Select* from the screen menu.
3. Select the CCN/JBUS Gateway from the Controls list.
4. Select *Modify* from the screen menu.
5. Select *Controller* from the screen menu
6. Select the desired configuration table from the resulting list of tables.

4.4 SAVING CONFIGURATION TABLES

To save configuration changes:

1. Press the F2 key to activate the screen menu.
2. Select *Save* from the menu to store the configuration in the Building Supervisor or Network Service Tool.
3. Select *Download* from the menu to transmit the configured data to the controller.

4.5 CONTROLLER IDENTIFICATION (CTRL_ID) TABLE

In the CCN/JBUS Gateway there is one Controller Identification Table. It contains product identification information that is input when module is assembled. By changing the information that appears in this table, you can change the name description, and location that appears for the Gateway in the Building Supervisor or Network Service Tools Controls List.

4.6 CCN (CCNCONF) TABLE

Figure 4 illustrates the CCN Configuration Table as displayed by the Building Supervisor or the Network Service Tool. An explanation of each configuration decision follows.

Figure 4
CCN Configuration (CCNCONF) Table

MODIFY CONTROLLER CONFIG

Save Upload Download Copy Edit Quit
Modify data; Press F2 to activate menu

DESCRIPTION	STATUS	POINT
Device Bus Number	0	dev_bus
Device Element Number	1	dev_elem
Reading Update Rate	30	r_rate
Writing Update Rate	60	w_rate
Read inst min wait time	60	ins_rate
Write inst min wait time	60	win_rate
Alarms Update Rate	5	alm_rate
Alarm Update Select	0/1/2/3	alm_sel
No Alarm Trigger Value	0	alm_tr_v
Alarm Trigger Table Name		alm_tr_t
Alarm Trigger Point Name		alm_tr_p
Alarm Read Point Name 2		alm_r_p2
Alarm Read Point Name 3		alm_r_p3
Alarm Read Point Name 4		alm_r_p4
Alarm Read Point Name 5		alm_r_p5

Device Bus Number

This decision is used to enter the bus number of the system device that the Gateway must interface.

Allowable Entries 0-239 (bus number)

Default Value 0

Device Element Number

This decision is used to enter the system element number of the device that the Gateway must interface.

Allowable Entries 1-239 (system element number)

Default Value 0

Reading Update Rate

This decision is used to specify the time interval at which the Gateway is to collect CCN data.

Allowable Entries 6 to 600 seconds

Default Value 30 seconds

Writing Update Rate

This decision is used to specify the time interval at which the Gateway is to write or force CCN data.

Allowable Entries 10 to 600 seconds

Default Value 60 seconds

Read Inst min wait time

This decision is used to specify the minimum time interval between two complete reading of points from instanced tables.

Allowable Entries 10 to 600 seconds

Default Value 60 seconds

Read Inst min wait time

This decision is used to specify the minimum time interval between two complete writting of points from instanced tables.

Allowable Entries 10 to 600 seconds

Default Value 60 seconds

Alarm Update Rate

This decision is used to specify the time interval at which the Gateway is to collect alarm from the device it is attached to. Update of alarms depends on the Alarm Update Select decision (see description below).

Allowable Entries 3 to 20 minutes

Default Value 5 minutes

Alarm Update Select

This decision is used to specify what will cause the alarms update operation to begin.

- If this decision is set to 0 no collect of alarm is done on the CCN controller attached to the Gateway.
- If this decision is set to 1, collection of alarms will be done continuously at the interval specified in the Alarm Update Rate decision.
- If this decision is set to 2, collection of alarms will start based on the status of an alarm trigger point. This alarm trigger point is defined in decision below.
- If this decision is set to 3, collection of alarms will be done through the reading, in controller attached to the gateway, of points containing the alarms values.

Allowable Entries 0/1/2/3

Default Value 0

Note Since the decision 2 (alarm event triggered collection) allows to reduce the traffic due to alarm collection on the CCN network, it is hardly

recommended to prefer it to the decision 1 (alarm periodically collection).

No Alarm Trigger Value

When event triggered alarm collection is to begin based on comparison between a configured value and the value of the "Alarm Trigger Point" from which alarms will be collected, this value is used to enter the value used for comparison. If the "Alarm Trigger Point" has a different value from the value entered here, then alarm collection will start and will continue at the "Alarm Update Rate" defined above. Alarm collection will continue until the "Alarm Trigger Point" recovers the "No Alarm Trigger Value". If the Alarm Trigger Point value is equal to the "No Alarm Trigger Value" then no collect of alarm will be done.

Allowable Entries 0 to 255

Default Value 0

Alarm Trigger Table Name

This decision is used to specify the CCN table which contains the point being used as an alarm trigger. This table can be a points display or a maintenance table.
It can also be used to describe the table name where to read the points.

Allowable Entries 1-8 alphanumeric characters

Default Value blank

Alarm Trigger Point Name

This decision is used to specify the name of the point being used as an alarm trigger. This point can be contained in a points display or a maintenance table. This point must be of integer or ASCII format otherwise an illegal configuration will be detected.
It can also be used to describe the first Alarm point name to read.(in this case caracteristics are the same that those described for Alarm read point name 2,…,5)

Allowable Entries 1-8 alphanumeric characters

Default Value blank

Alarm Read Point Name 2,..,5

This decision is used to specify the name of the second point being used to describe an alarm point to read. This point can be contained in a points display table. This point must be of integer or ASCII format otherwise an illegal configuration will be detected.
It can also be used to describe the first Alarm point name to read.

Allowable Entries 1-8 alphanumeric characters

Default Value blank

4.7 JBUS (JBUSCONF) TABLE

Figure 5 illustrates the JBUS Configuration Table as displayed by the Building Supervisor or the Network Service Tool. An explanation of each configuration decision follows.

Figure 5
JBUS Configuration (JBUSCONF) Table

MODIFY CONTROLLER CONFIG

Save Upload Download Copy Edit Quit
Modify data; Press F2 to activate menu

DESCRIPTION	STATUS	POINT
JBUS Address	1	jbus_add
JBUS Communication Rate	9 600	jbus_bau
JBUS Frame	0	jbus_par
0 = No parity 1 stop bit		
1 = Odd parity 1 stop bit		
2 = Even parity 1 stop bit		
3 = No parity 2 stop bit		
4 = Odd parity 2 stop bit		
5 = Even parity 2 stop bit		
UPLOAD REQUIRED FOR LAST DATA ! ! !		

JBUS Address
This decision is used to enter the slave JBUS address of the Gateway.
Allowable Entries 1-255
Default Value 1

JBUS Communication Rate
This decision is used to enter the operating rate at which the Gateway communicates on its JBUS port. If an incorrect value is entered then the default 9600 bauds rate will be used.
Allowable Entries 300/600/1200/2400/4800/9600 bauds
Default Value 9600

JBUS Frame (New)
This decision is used to enter the slave JBUS frame parity and stop bit .

Allowable Entries 0-5
Default Value 0

If one of these 3 values is modified, the board has to be reset within 2.5 seconds else the values of the jbus register will be kept.

4.8 COLLECT POINTS CONFIGURATION TABLES

CCN/JBUS Gateway contains four tables named RPOINT1, RPOINT2, RPOINT3 and RPOINT4 used for configuring decisions allowing 40 points (10 points per table) to be collected from the controller attached to the Gateway. Data collected will be stored in register 0 to 39. In order to be collected, each point must be identified by two decisions: the first decision provides the name of the point to be collected, the second decision gives the name of the CCN table which contains this point.

Figure 6 shows the table RPOINT1 as it appears on the Building Supervisor or the Network Service Tool screen. The description that follow details the two decisions that configure the first point to be collected. The same two decisions are repeated for point 2 to point 10. Description of others RPOINT tables is similar to this one.

Figure 6
Collect Point Configuration (RPOINT1) Table

MODIFY CONTROLLER CONFIG

Save Upload Download Copy Edit Quit
Modify data; Press F2 to activate menu

DESCRIPTION	STATUS	POINT
Collect Point Name 1	9 Characters	rp_r_0
Table Name	8 Characters	rt_r_0
Collect Point Name 2	9 Characters	rp_r_1
Table Name	8 Characters	rt_r_1
Collect Point Name 3	9 Characters	rp_r_2
Table Name	8 Characters	rt_r_2
Collect Point Name 9	9 Characters	rp_r_8
Table Name	8 Characters	rt_r_8
Collect Point Name 10	9 Characters	rp_r_9
Table Name	8 Characters	rt_r_9

Collect Point Name 1

This decision is used to enter the descriptor that identifies the point from which data is to be collected. All points contained in Points Display, Setpoint and Maintenance CCN tables can be collected. To determine the correct point name, display the desired table in Controls. Point names are shown in the rightmost column under the heading Point. The point name must be entered exactly as it appears in the table. This includes hyphens, periods and upper or lowercase.

This field comprises a ninth character that can be used to enter a "**!**". Exclamation mark set at ninth position means that floating point will be forced to integer. In that case the following will be applied to the point:

- point will not be multiplied by 10 when stored into the register
- point decimal digit will be removed
- point will be transmitted as a 2 bytes **unsigned integer** to the JBUS off-network.
- If the point is negative, 0 will be stored into the register.

This configuration is useful to store into register and to transmit to the JBUS off-network positive floating value that can overflow a two bytes capacity storage (because maximum positive floating value that can be stored in a two bytes register is 32767).
Avoid to use this configuration with values that can be negative since negative value are clamped to 0. Using this configuration with non floating points will have no effect.

Example: compressors A1 operating hours (HR_A1) on Flotronic II phase 3 are declared as floating points. Adding "!" at the ninth position of the collect point name configuration will allow to collect operating time in register from 0 to 65535 hours instead of 0 to 3276 hours without this configuration.

Allowable Entries 1-9 alphanumeric characters. If the first character is a blank then the point will be ignored. The 8 first characters are used to enter the point name. The ninth character is used to enter the flag "!".All characters different from "!" will be ignored with no consequence.

Default Value blank

Table Name

This decision is used to enter the descriptor that identifies the CCN table containing the point from which data is to be collected. Only points contained in Point Display, Setpoint and Maintenance CCN tables can be collected. To determine the correct table name, display the desired table in controls. Table names are shown in the leftmost column under the heading Name once Point (for Point Display tables) or Modify/Ctrl (for Setpoint tables) or Diagnostic/Maintenance (for Maintenance tables) has been picked. The point name must be entered exactly as it appears in the table. This includes hyphens, periods and upper or lowercase.

Allowable Entries 1-8 alphanumeric characters. If the first character is a blank then the point will be ignored.

Default Value blank

Note: Descriptors that identify each Collect Point Name are shown in the rightmost column of this screen. They are named rp_r_x, where x (x= 0 to 39) provides the JBUS address of this point in decimal (e.g. rp_r_12 means that the Collected Point Name 13 can be read by the off-network at the JBUS register address 12).

4.9 WRITE SETPOINT (WDEC) CONFIGURATION TABLE

CCN/JBUS Gateway contains one table named WDEC for configuring decisions allowing 12 setpoints to be written into the controller attached to the Gateway. In order to be written, each setpoint must be identified by two decisions: the first decision provides the name of the point to be written, the second decision gives the name of the CCN Setpoint table which contains this setpoint.

Figure 7 shows the table WDEC as it appears on the Building Supervisor or the Network Service Tool screen. The description that follow details the two decisions that identify the first setpoint. The same two decisions are repeated for setpoint 2 to setpoint 12.

Figure 7
Write Setpoint Configuration (WDEC) Table

MODIFY CONTROLLER CONFIG

Save Upload Download Copy Edit Quit
Modify data; Press F2 to activate menu

DESCRIPTION	STATUS	POINT
Write Setpoint Name 1	8 Characters	wd_r_111
Table Name	8 Characters	wt_r_111
Write Setpoint Name 2	8 Characters	wd_r_112
Table Name	8 Characters	wt_r_112
Write Setpoint Name 3	8 Characters	wd_r_113
Table Name	8 Characters	wt_r_113
Write Setpoint Name 11	8 Characters	wd_r_121
Table Name	8 Characters	wt_r_121
Write Setpoint Name 12	8 Characters	wd_r_122
Table Name	8 Characters	wt_r_122

Write Setpoint Name 1

This decision is used to enter the descriptor that identifies the setpoint to which data is to be written. All setpoints contained in Setpoint tables can be written. To determine the correct setpoint name, display the desired table in Controls. Setpoint names are shown in the rightmost column under the heading Point. The setpoint name must be entered exactly as it appears in the table. This includes hyphens, periods and upper or lowercase.

Allowable Entries 1-8 alphanumeric characters. If the first character is a blank then the point will be ignored.

Default Value blank

Table Name

This decision is used to enter the descriptor that identifies the CCN Setpoint table containing the setpoint to be written. To determine the correct table name, display the desired table in Controls.
Table names are shown in the leftmost column under the heading Name once Modify/Ctrl has been picked. The point name must be entered exactly as it appears in the table. This includes hyphens, periods and upper or lowercase.

Allowable Entries 1-8 alphanumeric characters. If the first character is a blank then the point will be ignored.

Default Value blank

Note: Descriptors that identify each Write Setpoint Name are shown in the rightmost column of this screen. They are named wd_r_x, where x (x = 111 to 122) provides the JBUS address of this point in decimal (e.g. wd_r_112 means that the Setpoint Name 2 can be written by the off-network at the JBUS register address 112).

4.10 FORCE VARIABLE (FVAR) CONFIGURATION TABLE

CCN/JBUS Gateway contains one table named FVAR for configuring decisions allowing 10 variables to be forced into the controller attached to the Gateway. In order to be forced, each variable must be identified by two decisions: first provides the name of the variable to be forced, second gives the name of the CCN Point Display table which contains this variable.

Figure 8 shows the table FVAR as it appears on the Building Supervisor or the Network Service Tool screen. The description that follow details the two decisions that identify the first variable. The same two decisions are repeated for variables 2 to 10.

Figure 8
Force Variable Configuration (FVAR) Table

MODIFY CONTROLLER CONFIG

Save Upload Download Copy Edit Quit
Modify data; Press F2 to activate menu

DESCRIPTION	STATUS	POINT
Force Variable Name 1	8 Characters	fv_r_123
Table Name	8 Characters	ft_r_123
Force Variable Name 2	8 Characters	fv_r_124
Table Name	8 Characters	ft_r_124
Force Variable Name 3	8 Characters	fv_r_125
Table Name	8 Characters	ft_r_125
Force Variable Name 9	8 Characters	fv_r_131
Table Name	8 Characters	ft_r_131
Force Variable Name 10	8 Characters	fv_r_132
Table Name	8 Characters	ft_r_132

Force Variable Name 1

This decision is used to enter the descriptor that identifies the variable to be forced. Depending on the device associated with the Gateway, only certain points are forcible. Refer to the device CCN Overview and Configuration Manual for information about display points that can be forced. To determine the correct variable name, display the desired point display table in Controls. Variable names are shown in the rightmost column under the heading Point. The point name must be entered exactly as it appears in the table. This includes hyphens, periods and upper or lowercase.

Allowable Entries 1-8 alphanumeric characters. If the first character is a blank then the point will be ignored.

Default Value blank

Table Name

This decision is used to enter the descriptor that identifies the CCN point display table containing the variable to be forced. To determine the correct table name, display the desired table in Controls.
Table names are shown in the leftmost column under the heading Name once Point has been picked. The point name must be entered exactly as it appears in the table. This includes hyphens, periods and upper or lowercase.

Allowable Entries 1-8 alphanumeric characters. If the first character is a blank then the point will be ignored.

Default Value blank

Note: Descriptors that identify each Force Variable Name are shown in the rightmost column of this screen. They are named fv_r_x, where x (x = 123 to 132) provides the JBUS address of this point in decimal (e.g. fv_r_124 means that the Variable Name 2 can be written by the off-network at the JBUS register address 124).

4.11 READ ALARM (R_ALARM) CONFIGURATION TABLE

CCN/JBUS Gateway contains one table named R_ALARM for configuring decisions allowing 15 alarms to be controlled in the controller attached to the Gateway. If the alarm is active, then the register attached to this alarm will be set to 1. Otherwise, register will be set to 0. In order to be controlled, each alarm must be identified by one decision which provides the index number of the alarm to be controlled. Usually, alarm index number corresponds to the alarm code number displayed on the controller itself. However, for some applications this index can be different from the code number. Refer to the device CCN Overview and Configuration Manual for information about alarm index codes.

Figure 9 shows the table R_ALARM as it appears on the Building Supervisor or the Network Service Tool screen. The description that follow details the decision that identify the first alarm. The same decision is repeated for alarms control 2 to 15.

Figure 9
Read Alarm Configuration (R_ALARM) Table

MODIFY CONTROLLER CONFIG

Save Upload Download Copy Edit Quit
Modify data; Press F2 to activate menu

DESCRIPTION	STATUS	POINT
Read Alarm #1	0	ra_r_46
Read Alarm #2	0	ra_r_47
Read Alarm #3	0	ra_r_48
Read Alarm #4	0	ra_r_49
Read Alarm #5	0	ra_r_50
Read Alarm #6	0	ra_r_51
Read Alarm #7	0	ra_r_52
Read Alarm #8	0	ra_r_53
Read Alarm #9	0	ra_r_54
Read Alarm #14	0	ra_r_59
Read Alarm #15	0	ra_r_60

Read Alarm #1

This decision is used to enter the descriptor that identifies the alarm index to be controlled. Refer to the device CCN Overview and Configuration Manual for information about alarm index codes.

Allowable Entries 0-100

Default Value 0

Note: Descriptors that identify each Read Alarm Number are shown in the rightmost column of this screen. They are named ra_r_x, where x (x = 46 to 60) provides the JBUS address of this point in decimal (e.g. ra_r_49 means that the Read Alarm Status number 49 can be controlled by the off-network at the JBUS register address 49).

4.12 DISPLAY REGISTER (REG_CONF) CONFIGURATION TABLE

CCN/JBUS Gateway contains one table named REG_CONF for configuring decisions allowing 5 Gateway registers (containing JBUS words) to be displayed in the Gateway Maintenance table REG_STAT. Display format can be selected to be either in decimal or hexadecimal format.

Figure 10 shows the table REG_CONF as it appears on the Building Supervisor or the Network Service Tool screen. The description that follow details the decision that identify the number of the first register to be displayed. The same decision is repeated for register to display 2 to 5.

Figure 10 Display Register Configuration (REG_CONF) Table

MODIFY CONTROLLER CONFIG

Save Upload Download Copy Edit Quit
Modify data; Press F2 to activate menu

DESCRIPTION	STATUS	POINT
Register to Display #1 ?	0	regi_1
Register to Display #2 ?	0	regi_2
Register to Display #3 ?	0	regi_3
Register to Display #4 ?	0	regi_4
Register to Display #5 ?	0	regi_5
Register Display Format	0/1	regi_df

Register to display #1 ?

This decision is used to enter the number of the register (which is equivalent to the JBUS word address) whose content is to be displayed in the CCN Maintenance table REG_STAT point d_regi_1 (Register Value #1).

Allowable Entries 0-7771

Default Value 0

Register Displaying Format

This decision is used to enter in which format register contents must be displayed.

Allowable Entries 0 = decimal format
1 = hexadecimal format

Default Value 0

4.13 GATEWAY INIT (GWY_INIT) CONFIGURATION TABLE

CCN/JBUS Gateway contains one table named GWY_INIT for configuring decisions allowing the Gateway to be initialised. This decisions must be used each time one decision contained in the configuration table CCNCONF, JBUSCONF, RPOINT1, RPOINT2, RPOINT3, RPOINT4, WDEC, FVAR, RALARM has been modified. It is not necessary to use this decision when modifying the table REG_CONF. This decision allows to run the Gateway initialisation sequence (see section 3.5.2). Setting this decision to *yes* has exactly the same effect then to apply a power on reset on the board.

Figure 11 shows the table GWY_INIT as it appears on the Building Supervisor or the Network Service Tool screen.

Figure 11
GWY_INIT Configuration (GW_INIT) Table

MODIFY CONTROLLER CONFIG

Save Upload Download Copy Edit Quit
Modify data; Press F2 to activate menu

DESCRIPTION	STATUS	POINT
**********		
* Gateway Init *	Yes/No	gw_init
**********		
**********		
* default config *	Yes/No	def_conf
**********		
**********		
* Jbus order *	0/1	Jbus_ord
* by var name = 0 *		
* by element = 1 *		
**********		

Gateway Init

When this decision is set to *Yes* and downloaded to the Gateway, the Gateway operates an initialisation sequence. Any tables that may have been configured before the initialisation sequence remain unchanged. After initialisation the Gateway automatically sets this decision back to *No*.

Warning Do not save the configuration while the Gateway decision is set to *Yes*.
Allowable Entries Yes/No
Default Value No

Default Config

When this decision is set to *Yes* and downloaded to the Gateway, the Gateway uploads default configuration from device to interface and fill RPOINT1, RPOINT2 ... and operates an initialisation sequence. (like decision above). After init, the Gateway automatically sets this decision back to *No*.

Warning Do not save the configuration while the Gateway decision is set to *Yes*.
Allowable Entries Yes/No
Default Value Yes when no config is entered.

Jbus Order (new)

When this decision is set to 0 or 1 and downloaded to the Gateway, the Jbus order is configured variable name configuration or in element configuration as explained in section 3.5

Warning -
Allowable Entries 0/1
Default Value 1 when no config is entered.

4.14 USER STRINGS (STRG_DEF) CONFIGURATION TABLE

There are an array of 65 preset strings and codes (referred to appendix D). These strings have been created for existing chillers mostly built by CSA. Since products linked with this gateway may evolve and new products may be connected with the gateway in the future, new strings will then be necessary. This table allows user to enter new strings if not available on preset strings (jbus codes will start from 70).

Figure 11B shows the table STRG_DEF as it appears on the Building Supervisor or the Network Service Tool screen.

Figure 11B
GWY_INIT Configuration (GW_INIT) Table

MODIFY CONTROLLER CONFIG

Save Upload Download Copy Edit Quit
Modify data; Press F2 to activate menu

DESCRIPTION	STATUS	POINT
user defined string 70	'' ''	strg_70
user defined string 71	'' ''	strg_71
user defined string 72	'' ''	strg_72
. . . . .		
user defined string 89	'' ''	strg_89

strg_70 up to 8 character can be entered.
Warning This string shall not be included in the list of preset strings provided in appendix as the Gateway starts to read from the list first and when it dose not find in the list it will look for this string. Gateway decision is set to *Yes*.
Allowable Entries alpha characters
Default Value blank

strg_71 to strg_89 idem than strg_70.

4.15 COLLECT INSTANCED POINTS CONFIGURATION TABLES

CCN/JBUS Gateway contains four tables named INSTANCE, INSTANC2, INSTANC3 and INSTANC4 used for configuring decisions allowing 35 points (10 points per table for the 3 first one and 5 for INSTANC4) to be collected from the multi instanced element attached to the Gateway. Data collected will be stored in register 200 to 4679. In order to be collected, each point must be identified by three decisions: the first decision provides the name of the point to be collected, the second decision gives the name of the CCN table which contains the description of this point. The third decision is the instances number where to collect data. this decision is made in tables 6XX_INS see section 4.15 for more details

Figure 11C shows the table INSTANCE as it appears on the Building Supervisor or the Network Service Tool screen. The description that follow details the two decisions that configure the first instance point to be collected. The same two decisions are repeated for point 2 to point 10. Description of INSTANC2 and INSTANC3 table is similar to this one. INSTANC4 contains only 5 * 2decisions.

Figure 11C
Collect Point Configuration (INSTANCE) Table

MODIFY CONTROLLER CONFIG

Save Upload Download Copy Edit Quit
Modify data; Press F2 to activate menu

DESCRIPTION	STATUS	POINT
Instance Point Name 01	9 Characters	Ip_r_0
Table Name	8 Characters	It_r_0
Instance Point Name 02	9 Characters	Ip_r_1
Table Name	8 Characters	It_r_1
Instance Point Name 03	9 Characters	Ip_r_2
Table Name	8 Characters	It_r_2
Instance Point Name 09	9 Characters	Ip_r_8
Table Name	8 Characters	It_r_8
Instance Point Name 10	9 Characters	Ip_r_9
Table Name	8 Characters	it_r_9

Instance Point Name 1

This decision is used to enter the descriptor that identifies the point from which data is to be collected. All points contained in POC-like definition tables can be collected. To determine the correct point name, display the desired table in Controls. Point names are shown in the rightmost column under the heading Point. The point name must be entered exactly as it appears in the table. This includes hyphens, periods and upper or lowercase.

This field comprises a ninth character that can be used to enter a "**!**". Exclamation mark set at ninth position means that floating point will be forced to integer. In that case the following will be applied to the point:

- point will not be multiplied by 10 when stored into the register
- point decimal digit will be removed
- point will be transmitted as a 2 bytes **unsigned integer** to the JBUS off-network.

- If the point is negative, 0 will be stored into the register.

This configuration is useful to store into register and to transmit to the JBUS off-network positive floating value that can overflow a two bytes capacity storage (because maximum positive floating value that can be stored in a two bytes register is 32767).
Avoid to use this configuration with values that can be negative since negative value are clamped to 0. Using this configuration with non floating points will have no effect.

Example: compressors A1 operating hours (HR_A1) on Flotronic II phase 3 are declared as floating points. Adding "!" at the ninth position of the collect point name configuration will allow to collect operating time in register from 0 to 65535 hours instead of 0 to 3276 hours without this configuration.

Allowable Entries 1-9 alphanumeric characters. If the first character is a blank then the point will be ignored. The 8 first characters are used to enter the point name. The ninth character is used to enter the flag "!".All characters different from "!" will be ignored with no consequence.

Default Value blank

Table Name

This decision is used to enter the descriptor that identifies the CCN table containing the point from which data is to be collected. Only points contained in POC like definition table and POC service and Maintenance CCN tables can be collected. To determine the correct table name, display the desired table in Controls. Table names are shown in the leftmost column under the heading Modify/Ctrl (for POC like definition and POC service tables) or Diagnostic/Maintenance (for Maintenance tables) has been picked. Only table's name that got sub menus with instances are available. The point name must be entered exactly as it appears in the table. This includes hyphens, periods and upper or lowercase.

Allowable Entries 1-8 alphanumeric characters. If the first character is a blank then the point will be ignored.

Default Value blank

4.16 CHOOSE INSTANCES CONFIGURATION TABLES

CCN/JBUS Gateway contains seven tables named 6XX_INS1; 6XX_INS2, 6XX_INS3, 6XX_INS4, 6XX_INS5, 6XX_INS6, 6XX_INS7 used for configuring decision allowing 128 instances (20 instances per table for the 5 first one and 8 instances for 6XX_INS7) to collect from them the 35 points defined in section 4.14.. Data collected will be stored in register 200 to 4679. This is the third decision needed to collect points from multiple instance tables. The two first decision are described in section 2.14.

Figure 11D shows the table 6XX_INS1 as it appears on the Building Supervisor or the Network Service Tool screen. The description that follow details the decision that configure the collection order of the instance point. The same decisions is repeated for point 2 to point 20. Description of others 6XX_INS tables is similar to this one except 6XX_INS7 that contains only 8 instance decision.

Figure 11D
Collect Point Configuration (6XX_INS1) Table

MODIFY CONTROLLER CONFIG

Save Upload Download Copy Edit Quit
Modify data; Press F2 to activate menu

DESCRIPTION	STATUS	POINT
JBUS ord 01,instance nb?	0	Ins_01
JBUS ord 02,instance nb?	0	Ins_02
JBUS ord 03,instance nb?	0	Ins_03
JBUS ord 04,instance nb?	0	Ins_04
JBUS ord 05,instance nb?	0	Ins_05
JBUS ord 06,instance nb?	0	Ins_06
JBUS ord 17,instance nb?	0	Ins_17
JBUS ord 18,instance nb?	0	Ins_18
JBUS ord 19,instance nb?	0	Ins_19
JBUS ord 20,instance nb?	0	Ins_20

JBUS ord 01,Instance nb?

This decision is used to decide if the points described in tables INSTANCE to INSTANC7 will be collected and stored in Jbus order 01. if the user enter a number different of zero, it will represents the instance number where to collect data, and Jbus order 01 will be selected for this instance. The user can for example put at the first place in the Jbus order the instance 45, entering number 45. If the user has chosen to order the Jbus by element, the first element of the Jbus would be the instance 45. If he has chosen to order the Jbus by variables, the first instance of every variable will be the instance 45.

Allowable Entries 0-128

Default Value 0 when no configuration is set.

4.17 WRITE INSTANCED POINTS CONFIGURATION TABLE

CCN/JBUS Gateway contains a table named W_PT_INS used for configuring decisions allowing 8 points to be written from the multi instanced element attached to the Gateway. In order to be written, each point must be identified by three decisions: the first decision provides the name of the point to be written, the second decision gives the name of the CCN table which contains the description of this point. The third decision is the instances number where to collect data. this decision is made in tables 6XX_INS see section 4.15 for more details

Figure 11E shows the table W_PT_INS as it appears on the Building Supervisor or the Network Service Tool screen. The description that follow details the three decisions that configure the first instance point to be written. The same three decisions are repeated for point 2 to point 8.

Figure 11E
Collect Point Configuration (W_PT_INS) Table

MODIFY CONTROLLER CONFIG

Save Upload Download Copy Edit Quit
Modify data; Press F2 to activate menu

DESCRIPTION	STATUS	POINT
Write Inst Point Name 01	8 Characters	Ip_w_0
Table Name 01	8 Characters	It_w_0
Instance Point Name 02	8 Characters	Ip_w_1
Table Name 02	8 Characters	It_w_1
Instance Point Name 03	8 Characters	Ip_w_2
Table Name 03	8 Characters	It_w_2
Instance Point Name 07	8 Characters	Ip_w_6
Table Name 07	8 Characters	It_w_6
Instance Point Name 08	8 Characters	Ip_w_7
Table Name 08	8 Characters	it_w_7

Write Inst Point Name 1

This decision is used to enter the descriptor that identifies the point to be written. All points contained in multiple instance configuration tables can be written. To determine the correct point name, display the desired table in Controls. Point names are shown in the rightmost column under the heading Point. The point name must be entered exactly as it appears in the table. This includes hyphens, periods and upper or lowercase.

Allowable Entries 1-8 alphanumeric characters. If the first character is a blank then the point will be ignored.

Default Value blank

Table Name

This decision is used to enter the descriptor that identifies the CCN table containing the point to be written. Only points contained in multiple instance CCN tables can be written. To determine the correct table name, display the desired table in Controls.
Table names are shown in the leftmost column under the heading Name once Modify/Ctrl has been picked. Only table's name that got sub menus with instances are available. The point name must be entered exactly as it appears in the table. This includes hyphens, periods and upper or lowercase.

Allowable Entries 1-8 alphanumeric characters. If the first character is a blank then the point will be ignored.

Default Value blank

5 MAINTENANCE DESCRIPTION

5.1 GENERAL

Each Gateway contains the following maintenance tables:

- REG_STAT Register Display Table
- UPDATE Update Status Table

These tables allow to control the Gateway operations notably after configuration.

5.2 ACCESSING MAINTENANCE TABLES

Perform the following steps to display a maintenance table at the Building Supervisor or Network Service Tool:

1. Select the *Controls* function.
2. Select the menu item *Select* from the screen menu.
3. Select the CCN/JBUS Gateway that you wish to view from the Controls list.
4. From the resulting menu, Select *Diagnostic.*
5. From the resulting menu, Select *Maintenance.*
6. Select the desired maintenance table from the resulting list of tables.

5.3 UPDATE STATUS (UPDATE) MAINTENANCE TABLE

This table displays information regarding the status of the CCN/JBUS Gateway. The maintenance values displayed on this table are a read-only display of updated values. You cannot enter data into any maintenance fields or parameters. An explanation of each Gateway Maintenance value follows the illustration.

Figure 12 shows the table UPDATE as it appears on the Building Supervisor or the Network Service Tool screen.

Figure 12 Gateway Maintenance (UPDATE) Table

LIST POINT COMMANDS

Force Auto Service Quit
Select from list with Enter key

DESCRIPTION	STATUS	POINT
Reading ?	True/False	reading
Reading Instance ?	True/False	read_ins
Writing/Forcing ?	True/False	wr_force
Writing instance	True/False	wr_ins
Alarm Updating ?	True/False	alrm_upd
Alarm Trigger Value	0	trigger_v
Alarm Trigger Active ?	True/False	alrm_act
CCN/GWY Current Alarm	0	gw_alarm
Gateway Init Status	0	gw_init
JBUS Alarm	0	al_jbus

Reading

This field displays whether the Gateway is collecting data (through the CCN network) from the controller it interfaces. The Gateway reads values of the points that have been configured to be collected in the Gateway configuration tables RPOINT1, RPOINT2, RPOINT3 and RPOINT4. Rate of the reading update can be modified in the Gateway configuration table CCNCONF. Duration of the reading sequence depends of the number of points to be collected and of the CCN network traffic.

Valid Display True/False

Reading Instance

This field displays whether the Gateway is collecting data (through the CCN network) from the instanced elements of the controller it interfaces. The Gateway reads values of the points that have been configured to be collected in the Gateway configuration tables INSTANCE to INSTANC4. Rate of the reading update can be modified in the Gateway configuration table CCNCONF. Duration of the reading sequence depends of the number of points to be collected and of the CCN network traffic.

Valid Display True/False

Writing/Forcing

This field displays whether the Gateway is writing or forcing values (through the CCN network) into the controller it is attached to. The Gateway writes setpoints or force variables that have been defined in the Gateway configuration tables WDEC or FVAR. the Writing/forcing sequence runs at the "Writing/Forcing Update Rate" defined in the CCNCONF table and only if the Gateway has detected a writing command issued from the JBUS port. Duration of the writing/forcing sequence depends of the number of points to be written and of the CCN network traffic.

Valid Display True/False

Writing instance

This field displays whether the Gateway is writing values (through the CCN network) to the instanced elements of the controller it is attached to. The Gateway writes instanced variables that have been defined in the Gateway configuration tables W_PT_INS. the Writing sequence intervals are defined by the "Writing inst min wait time" in the CCNCONF table and only if the Gateway has detected a writing command issued from the JBUS port. Duration of the writing sequence depends of the number of points to be written and of the CCN network traffic.

Valid Display True/False

Alarm Updating

This field displays whether the Gateway is searching active alarms, (through the CCN network) from the controller it interfaces.

This field is set to *true* when any of the following is satisfied:

- "Alarm update Select", in CCNCONF configuration table, has been set to 1 and the alarm update period is active.
- "Alarm update Select", in CCNCONF configuration table, has been set to 2 and the Alarm Trigger has just switched from not active to active or both Alarm Trigger and alarm update period are active.

This field is set to *False* when the none of the above conditions is satisfied.

Duration of the alarm updating sequence depends on the controller interfaced by the Gateway and of the CCN network traffic.

Valid Display True/False

Alarm Trigger Value

This field displays the current value of the configured alarm trigger. If the selected trigger has an ASCII format then, the displayed value will fit codes provided by the ASCII strings data base (see appendix D). If the trigger point is an integer then real trigger value will be displayed.

Valid Display 0 to 999

Alarm Trigger Active

This field displays whether the Alarm trigger configured in the CCNCONF table is active or not. If the alarm trigger is active and if alarm reading is based on trigger update (see CCNCONF configuration table) then alarms will be searched in the module interfaced by the gateway at the rate defined by the "Alarm Update Period" in the CCNCONF configuration table.

This field is set to *True* when the current "Alarm Trigger Value" is different from the "No Alarm Trigger Value" defined in the CCNCONF configuration table.

This field is set to *False* when the current "Alarm Trigger Value" is equal to the "No Alarm Trigger Value" defined in the CCNCONF configuration table.

Valid Display True/False

Gateway Init Status

This field displays a value that indicates the init sequence the Gateway currently is in. Init sequence runs every time the Gateway is powered or every time the gw_init decision in the GWY_INIT table is set to *Yes*.

This field can take the following values:

- 0 means that the initialisation has successfully passed.
- 1 means that the Gateway is in initialisation standby. This standby delay runs for 1.5 minutes each time initialisation is applied to the Gateway. It allows controller connected to the Gateway to achieve its initialisation before the Gateway starts its own initialisation.
- 2 means that the Gateway is currently in its initialisation sequence. During this time, the Gateway controls the consistency of all its configuration, notably that points and tables that have been set exist and are accessible. In this state, communications are not allowed on the JBUS port.
- 3 means that initialisation has failed but will be retried (from the failed point) in a 3 minutes delay. This can occur either if a configured table in RPOINT1, RPOINT2, RPOINT3, RPOINT4, WDEC, INSTANCE to INSTANC4, W_PT_INS, FVAR, BUFCONF or CCNCONF doesn't exist in the controller attached to the Gateway or either if the configuration has been interrupted because of a high network traffic. Because it is impossible to get

difference between the two causes of initialisation failure described above, it is highly recommended, each time Gateway configuration is modified, to operate a Gateway initialisation with all devices different from the Gateway. And the controller connected to this Gateway should be removed from the CCN communication line. This shall allow to easily verify the consistency of the configuration since all "CCN/GW Current Alarm" showed in the next field will be due only to configuration errors and not to configuration typing errors. In this state, communications are not allowed on the JBUS port.

- 4 means that initialisation has definitively failed and that no retry will be done. This can occur because an incorrect or not allowed point name has been configured in table RPOINT1, RPOINT2, RPOINT3, RPOINT4, WDEC, INSTANCE to INSTANC4, W_PT_INS, FVAR REG_CONF or CCNCONF. The next field, "CCN/GW Current Alarm", provides the alarm cause. In this state, communications are allowed on the JBUS port but registers are not updated.
- 5 means that the gateway is currently in its auto configuration sequence. After this sequence the board will reboot and the normal initialisation sequence will be launched.

Duration of the initialisation sequence depends of the number of points configured and of the CCN network traffic.

Valid Display 0/1/2/3/4

CCN/GW Current Alarm

This field displays the current alarm code due to failure occurring on the CCN Communication side. Failure can be due either to the initialisation sequence or either to communication defaults during process. See in appendix B the CCN alarm description.

Valid Display 0 to 9999

JBUS Current Alarm

This field displays the current alarm code of failure occurring on the JBUS communication side. See in appendix C the JBUS alarm description.

Valid Display 0 to 11

5.4 REGISTERS (REG_STAT) MAINTENANCE TABLE

This table dynamically displays the content of 5 registers (JBUS Word) that has been selected through the CCN REG_CONF configuration table. Displaying format depends of the "Displaying Format" selected in the REG_CONF table: decimal, hexadecimal. In addition, the type of data stored into register is provided. The maintenance values displayed on this table are a read-only display of updated values. You cannot enter data into any maintenance fields or parameters. An explanation of each Gateway Maintenance value follows the illustration.

Figure 13 shows the table UPDATE as it appears on the Building Supervisor or the Network Service Tool screen. The description that follow details the maintenance values for the first register. The same description is repeated for register values 2 to 5.

Figure 13 Gateway Maintenance (REG_STAT) Table

LIST POINT COMMANDS

Force Auto Service Quit
Select from list with Enter key

DESCRIPTION	STATUS	POINT
Register Value #1	0	d_regi_1
Data Type	0/1/2/3	type_1
Register Value #2	0	d_regi_2
Data Type	0/1/2/3	type_2
Register Value #3	0	d_regi_3
Data Type	0/1/2/3	type_3
Register Value #4	0	d_regi_4
Data Type	0/1/2/3	type_4
Register Value #5	0	d_regi_5
Data Type	0/1/2/3	type_5

Register Value #1

This field displays the current data contained in the configured "Register to Display Number 1" in REG_CONF table. Displaying format depends of REG_CONF table configuration.

Valid Display -32767 to 655535 if the decimal "Displaying Format" has been selected.
Otherwise: 0 to h FFFF.

Data Type

This field displays the type of data contained in the configured "Register to Display Number 1" in REG_CONF table.

Valid Display

0 = Integer value
1 = Floating value. This means that the value is multiplied by 10 before being stored into the register. In consequence, value of this type which is collected by the off-network must be divided by 10 before being used and value which is written by the off-network into the Gateway must be previously multiplied by 10.
2 = ASCII value. The register content is an integer code value which represents this ASCII string. Each ASCII string has a code relation: see ASCII database in appendix D. e.g.: "Startup" is represented by the code 27.
3 = This was originally a floating value. But it has been forced to unsigned integer when configuring one of the RPOINT or INSTANCE table (see section 4.7 or 4.14).

APPENDIX A

JBUS MEMORY MAPPING

This allocation table provides the JBUS address of all registers accessible through JBUS commands.

R : Read
W : Write
* : doesn't apply to this register type
[ ] : numbers in brackets provide hexadecimal value
Point/Table : Gateway point and table where configuration must be done for this register to be active

REGISTER NUMBER/ADDRESS	REGISTER LSB ADDRESS	JBUS ACCESS	POINT/TABLE	DESCRIPTION	REMARKS
0 [h00]	8 [h8]	R	rp_r_0 / RPOINT1	Collect Point #1	These registers provide the value of points that have been configured (tables RPOINT1, RPOINT2, RPOINT3 and RPOINT4) to be collected from the interfaced controller. Registers are set to 0 when unused.
1 [h01]	24 [h18]	R	Rp_r_1 / RPOINT1	Collect Point #2	
2 [h02]	40 [h28]	R	rp_r_2 / RPOINT1	Collect Point #3	
3 [h03]	56 [h38]	R	rp_r_3 / RPOINT1	Collect Point #4	
4 [h04]	72 [h48]	R	rp_r_4 / RPOINT1	Collect Point #5	
5 [h05]	88 [h58]	R	rp_r_5 / RPOINT1	Collect Point #6	
6 [h06]	104 [h68]	R	rp_r_6 / RPOINT1	Collect Point #7	
7 [h07]	120 [h78]	R	rp_r_7 / RPOINT1	Collect Point #8	
8 [h08]	136 [h88]	R	rp_r_8 / RPOINT1	Collect Point #9	
9 [h09]	152 [h98]	R	rp_r_9 / RPOINT1	Collect Point #10	
10 [h0A]	168 [hA8]	R	rp_r_10 / RPOINT2	Collect Point #11	
11 [h0B]	184 [hB8]	R	rp_r_11 / RPOINT2	Collect Point #12	
12 [h0C]	200 [hC8]	R	rp_r_12 / RPOINT2	Collect Point #13	
13 [h0D]	216 [hD8]	R	rp_r_13 / RPOINT2	Collect Point #14	
14 [h0E]	232 [hE8]	R	rp_r_14 / RPOINT2	Collect Point #15	
15 [h0F]	248 [hF8]	R	rp_r_15 / RPOINT2	Collect Point #16	
16 [h10]	264 [h108]	R	rp_r_16 / RPOINT2	Collect Point #17	
17 [h11]	280 [h118]	R	rp_r_17 / RPOINT2	Collect Point #18	
18 [h12]	296 [h128]	R	rp_r_18 / RPOINT2	Collect Point #19	
19 [h13]	312 [h138]	R	rp_r_19 / RPOINT2	Collect Point #20	
20 [h14]	328 [h148]	R	rp_r_20 / RPOINT3	Collect Point #21	
21 [h15]	344 [h158]	R	rp_r_21 / RPOINT3	Collect Point #22	
22 [h16]	360 [h168]	R	rp_r_22 / RPOINT3	Collect Point #23	
23 [h17]	376 [h178]	R	rp_r_23 / RPOINT3	Collect Point #24	
24 [h18]	392 [h188]	R	rp_r_24 / RPOINT3	Collect Point #25	
25 [h19]	408 [h198]	R	rp_r_25 / RPOINT3	Collect Point #26	
26 [h1A]	424 [h1A8]	R	rp_r_26 / RPOINT3	Collect Point #27	
27 [h1B]	440 [h1B8]	R	rp_r_27 / RPOINT3	Collect Point #28	
28 [h1C]	456 [h1C8]	R	rp_r_28 / RPOINT3	Collect Point #29	
29 [h1D]	472 [h1D8]	R	rp_r_29 / RPOINT3	Collect Point #30	
30 [h1E]	488 [h1E8]	R	rp_r_30 / RPOINT4	Collect Point #31	
31 [h1F]	504 [h1F8]	R	rp_r_31 / RPOINT4	Collect Point #32	
32 [h20]	520 [h208]	R	rp_r_32 / RPOINT4	Collect Point #33	
33 [h21]	536 [h218]	R	rp_r_33 / RPOINT4	Collect Point #34	
34 [h22]	552 [h228]	R	rp_r_34 / RPOINT4	Collect Point #35	
35 [h23]	568 [h238]	R	rp_r_35 / RPOINT4	Collect Point #36	
36 [h24]	584 [h248]	R	rp_r_36 / RPOINT4	Collect Point #37	
37 [h25]	600 [h258]	R	rp_r_37 / RPOINT4	Collect Point #38	
38 [h26]	616 [h268]	R	rp_r_38 / RPOINT4	Collect Point #39	
39 [h27]	632 [h278]	R	rp_r_39 / RPOINT4	Collect Point #40	

REGISTER NUMBER/ADDRESS	REGISTER LSB ADDRESS	JBUS ACCESS	POINT/TABLE	DESCRIPTION	REMARKS
40 [h28]	*	R		Controller Active alarms	Total nb of active alarms.
41 [h29]	*	R		Current Alarm 1	Provide the code of up to 5 active alarms collected from the controller interfaced by the Gateway. These are stored in arrival order. Used when alarm collection has been configured.
42 [h2A]	*	R		Current Alarm 2	
43 [h2B]	*	R		Current Alarm 3	
44 [h2C]	*	R		Current Alarm 4	
45 [h2D]	*	R		Current Alarm 5	
46 [h2E]	744 [h2E8]	R	ra_r_46 / R_ALARM	Alarm #1	Configured Alarms. The register is set to 1 when its corresponding alarm is active. If not, the register is set to 0. Unused (not configured) registers are set to 0. Used when alarm collection has been configured.
47 [h2F]	760 [h2F8]	R	ra_r_47 / R_ALARM	Alarm #2	
48 [h30]	776 [h308]	R	ra_r_48 / R_ALARM	Alarm #3	
49 [h31]	792 [h318]	R	ra_r_49 / R_ALARM	Alarm #4	
50 [h32]	808 [h328]	R	ra_r_50 / R_ALARM	Alarm #5	
51 [h33]	824 [h338]	R	ra_r_51 / R_ALARM	Alarm #6	
52 [h34]	840 [h348]	R	ra_r_52 / R_ALARM	Alarm #7	
53 [h35]	856 [h358]	R	ra_r_53 / R_ALARM	Alarm #8	
54 [h36]	872 [h368]	R	ra_r_54 / R_ALARM	Alarm #9	
55 [h37]	888 [h378]	R	ra_r_55 / R_ALARM	Alarm #10	
56 [h38]	904 [h388]	R	ra_r_56 / R_ALARM	Alarm #11	
57 [h39]	920 [h398]	R	ra_r_57 / R_ALARM	Alarm #12	
58 [h3A]	936 [h3A8]	R	ra_r_58 / R_ALARM	Alarm #13	
59 [h3B]	952 [h3B8]	R	ra_r_59 / R_ALARM	Alarm #14	
60 [h3C]	968 [h3C8]	R	ra_r_60 / R_ALARM	Alarm #15	
61 [h3D]	*	R		Gateway Alarm Code	Gateway current alm code.
62 [h3E]	-	-		-	Unused
63 [h3F]	-	-		-	
64 [h40]	-	-		-	
65 [h41]	*	R	alm_tr_p/CCNCONF	Trigger Point Value	Value of alarm trigger.
66 [h42]	*	R		JBUS Alarm Number	Incorrect JBUS command.

67 [h43]	1080 [h438]	R		Setpoint #1 Update flag	This value is set to 1 when a writing setpoint operation is required by JBUS. When the writing operation is achieved this flag returns to 0.
68 [h44]	1096 [h448]	R		Setpoint #2 Update flag	
69 [h45]	1112 [h458]	R		Setpoint #3 Update flag	
70 [h46]	1128 [h468]	R		Setpoint #4 Update flag	
71 [h47]	1144 [h478]	R		Setpoint #5 Update flag	
72 [h48]	1160 [h488]	R		Setpoint #6 Update flag	
73 [h49]	1176 [h498]	R		Setpoint #7 Update flag	
74 [h4A]	1192 [h4B8]	R		Setpoint #8 Update flag	
75 [h4B]	1208 [h4B8]	R		Setpoint #9 Update flag	
76 [h4C]	1224 [h4A8]	R		Setpoint #10 Update flg	
77 [h4D]	1240 [h4B8]	R		Setpoint #11 Update flg	
78 [h4E]	1256 [h4C8]	R		Setpoint #12 Update flg	
79 [h4F]	*	R		Write setpoint #1 - Status	0 : Operation achieved 1 :Access denied 2 :CCN communication failure 3 :Operation in progress -1 :Illegal format
80 [h50]	*	R		Write setpoint #2 - Status	
81 [h51]	*	R		Write setpoint #3 - Status	
82 [h52]	*	R		Write setpoint #4 - Status	
83 [h53]	*	R		Write setpoint #5 - Status	
84 [h54]	*	R		Write setpoint #6 - Status	

REGISTER NUMBER/ADDRESS	REGISTER LSB ADDRESS	JBUS ACCESS	POINT/TABLE	DESCRIPTION	REMARKS
85 [h55]	*	R		Write setpoint #7 - Status	
86 [h56]	*	R		Write setpoint #8 - Status	
87 [h57]	*	R		Write setpoint #9 - Status	
88 [h58]	*	R		Write setpoint #10Status	
89 [h59]	*	R		Write setpoint #11Status	
90 [h5A]	*	R		Write setpoint #12Status	
91 [h5B]	*	R/W		Forcing Flag #1	This value is set to 1 when a forcing operation is required by JBUS. When the forcing operation is achieved this flag returns to 0. This value must be set to 2 when auto is required.
92 [h5C]	*	R/W		Forcing Flag #2	
93 [h5D]	*	R/W		Forcing Flag #3	
94 [h5E]	*	R/W		Forcing Flag #4	
95 [h5F]	*	R/W		Forcing Flag #5	
96 [h60]	*	R/W		Forcing Flag #6	
97 [h61]	*	R/W		Forcing Flag #7	
98 [h62]	*	R/W		Forcing Flag #8	
99 [h63]	*	R/W		Forcing Flag #9	
100 [h64]	*	R/W		Forcing Flag #10	
101 [h65]	*	R		Forcing/Auto #1 - Status	0: Operation achieved 1: Access denied 2: CCN communication failure 3: Operation in progress -1: Illegal format
102 [h66]	*	R		Forcing/Auto #2 - Status	
103 [h67]	*	R		Forcing/Auto #3 - Status	
104 [h68]	*	R		Forcing/Auto #4 - Status	
105 [h69]	*	R		Forcing/Auto #5 - Status	
106 [h6A]	*	R		Forcing/Auto #6 - Status	
107 [h6B]	*	R		Forcing/Auto #7 - Status	
108 [h6C]	*	R		Forcing/Auto #8 - Status	
109 [h6D]	*	R		Forcing/Auto #9 - Status	
110 [h6E]	*	R		Forcing/Auto #10-Status	
111 [h6F]	*	R/W	wd_r_111	Setpoint value #1	Setpoints to be written into the CCN controller by the JBUS off-network. Registers 79 to 90 provide the status of the writing operation.
112 [h70]	*	R/W	wd_r_112	Setpoint value #2	
113 [h71]	*	R/W	wd_r_113	Setpoint value #3	
114 [h72]	*	R/W	wd_r_114	Setpoint value #4	
115 [h73]	*	R/W	wd_r_115	Setpoint value #5	
116 [h74]	*	R/W	wd_r_116	Setpoint value #6	
117 [h75]	*	R/W	wd_r_117	Setpoint value #7	
118 [h76]	*	R/W	wd_r_118	Setpoint value #8	
119 [h77]	*	R/W	wd_r_119	Setpoint value #9	
120 [h78]	*	R/W	wd_r_120	Setpoint value #10	
121 [h79]	*	R/W	wd_r_121	Setpoint value #11	
122 [h7A]	*	R/W	wd_r_122	Setpoint value #12	
123 [h7B]	1720 [h6B8]	R/W	fv_r_123	Forced Value #1	Values to be forced into the CCN controller that must be written by the JBUS off-network. Registers 101 to 110 provide the status of operation on forcing.
124 [h7C]	1736 [h6C8]	R/W	fv_r_124	Forced Value #2	
125 [h7D]	1752 [h6D8]	R/W	fv_r_125	Forced Value #3	
126 [h7E]	1768 [h6E8]	R/W	fv_r_126	Forced Value #4	
127 [h7F]	1784 [h6F8]	R/W	fv_r_127	Forced Value #5	
128 [h80]	1800 [h708]	R/W	fv_r_128	Forced Value #6	
129 [h81]	1816 [h718]	R/W	fv_r_129	Forced Value #7	
130 [h82]	1832 [h728]	R/W	fv_r_130	Forced Value #8	

REGISTER NUMBER/ADDRESS	REGISTER LSB ADDRESS	JBUS ACCESS	POINT/TABLE	DESCRIPTION	REMARKS
131 [h83]	1848 [h738]	R/W	fv_r_131	Forced Value #9	
132 [h84]	1864 [h748]	R/W	fv_r_132	Forced Value #10	

133 [h85]	*	R/W	jbus_add/JBUSCONF	JBUS baud rate	Accessible from JBUS and CCN.
134 [h86]	*	R/W	jbus_bau/JBUSCONF	JBUS Address	
135 [h87]	*	R/W	jbus_par/JBUSCONF	JBUS parity and stop bit	
136 [h88]	*	R/W	dev_bus/CCNCONF	CCN device bus number	Modifying those registers through JBUS, launch the auto configuration sequence
137 [h89]	*	R/W	dev_elem/CCNCONF	CCN device element nb	

200 [C8h]	*	R	**	Instance collected point	
,	,	,	,	.	
,	,	,	,	.	
,	,	,	,	.	
4679 []	*	R	**	Instance collected point	
4680	*	*	*	unused point	
.	.	.	.	.	
.	.		.	.	
.	.	.	.	.	
4699	*	*	*	unused point	
4700	*	R/W	Ip_w_0 instance 1	Instance write value	
4701	*	R/W	Ip_w_0 instance 2	Instance write value	
.	.	.	.	.	
.	.	.	.	.	
.	.	.	.	.	
5722	*	R/W	Ip_w_7 instance 127	Instance write value	
5723	*	R/W	Ip_w_7 instance 128	Instance write value	
5724	*	R	*	Instance writing flag	For ip_w_0 instance 1
.	.	.	.	.	
.	*	.	*	.	
.	*	.	*	.	
6747	*	R	*	Instance writing flag	For ip_w_7 instance 128
6748	*	R	*	Instance writing status	For ip_w_0 instance 1
.	.	.	.	.	.
.	.	.	.	.	.
.	.	.	.	.	.
7771	*	R	*	Instance writing status	For ip_w_7 instance 128

Note: At GW initialisation all registers are set to 0. During GW operations all unused registers are set to 0.

** : The points of registers 200 to 4679 are not fixed. The user can configure the Jbus address in order to place the variables he has chosen where he wants. The way to configure the JBUS order is explained in section 3.5 .

*** : The points of register 4700 to 7771 can't be associated with only one point, you have to specify the instance number.

APPENDIX B

GATEWAY ALARMS DESCRIPTION

Below is the list of Gateway alarm codes that can be displayed through the Gateway CCN Maintenance table UPDATE or through the Gateway register 61 [h3D] (JBUS off-network access).

Some of these alarms include parameters allowing to determine the exact location of the incorrect configuration.

GATEWAY ALARMS				
CODE	**DESCRIPTION**	**FAILURE TYPE**	**PARAMETERS DESCRIPTION**	**REMARKS**
1	No configuration table found	Initialisation	-	Gateway not configured
2	CCN communication failure	Process	-	Verify CCN bus wiring or the attached controller address. This failure can occur randomly because of high traffic on the CCN network.
3	Alarm table not found	Initialisation	-	The element interfaced by the Gateway doesn't contain alarm table.
4	Incorrect JBUS command	Process	-	Unknown JBUS command
8	Incorrect alarm trigger table name	Initialisation	-	Trigger table name configured in the Gateway CCNCONF table is incorrect. Verify it has been correctly spelt and verify in the interfaced controller that this table name is correct.
9	Incorrect alarm trigger point name	Initialisation	-	Trigger point name configured in the Gateway CCNCONF table is incorrect. Verify it has been correctly spelt and verify in the interfaced controller that this point name is correct and that it is included into the configured alarm trigger table.
10	Illegal alarm trigger point format	Initialisation	-	Alarm trigger point is not of the type integer or ASCII.
1 X YY	Incorrect collect point table name	Initialisation	X = 1 to 4 (table RPOINT number) YY = 01 to 10 (collect point number into table RPOINTX)	Collect table name YY configured in the Gateway CCN configuration table RPOINTX is incorrect. Verify it has been correctly spelt and verify in the interfaced controller that this table name is correct and that it is a Point Display, Setpoint or Maintenance table.
2 X YY	Incorrect collect point name	Initialisation		Collect point name YY configured in the Gateway CCN configuration table RPOINTX is incorrect. Verify it has been correctly spelt and verify in the interfaced controller that point name is correct and that it is included in the configured collect table.
3 X YY	Illegal collect point format	Initialisation		Collect point name YY configured in the Gateway CCN configuration table RPOINTX has a format not allowed by the Gateway.
4 Z YY	Incorrect instance point table name	Initialisation	Z = 1 to 4 (table INSTANCE number) YY = 01 to 10 (instance point number into table INSTANCE, INSTANC2, 3, 4)	Instance table name YY configured in the Gateway CCN configuration table INSTANCE (Z=1) or INSTANC2 (Z=2) is incorrect. Verify it has been correctly spelt and verify in the interfaced controller that this table name is correct and that it is a POC like definition table.
5 Z YY	Incorrect instance point name	Initialisation		Collect point name YY configured in the Gateway CCN configuration table INSTANCE (Z=1) or INSTANC2 (Z=2) is incorrect. Verify it has been correctly spelt and verify in the interfaced controller that point name is correct and that it is included in the configured collect table.
6 Z YY	Illegal instance format	Initialisation		Collect point name YY configured in the Gateway CCN configuration table INSTANCE (Z=1) or INSTANC2 (Z=2) has a format not allowed by the Gateway.

GATEWAY ALARMS				
CODE	**DESCRIPTION**	**FAILURE TYPE**	**PARAMETERS DESCRIPTION**	**REMARKS**
8 XXX	Same instance for two different places in JBUS.	Initialisation	XXX = 0 to 100	Instance table number XXX has the same instance nb than another place in JBUS. This two nb should be different to avoid to read two times the same thing.
90 YY	Incorrect write instance table name	Initialisation	YY = 01 to 08 (instance point number into table W_PT_INS)	Instance table name YY configured in the Gateway CCN configuration table W_PT_INS is incorrect. Verify it has been correctly spelt and verify in the interfaced controller that this table name is correct and that it is multiple instance configuration table
100 YY	Incorrect write instance point name	Initialisation		Collect point name YY configured in the Gateway CCN configuration table W_PT_INS is incorrect. Verify it has been correctly spelt and verify in the interfaced controller that point name is correct and that it is included in the configured writing table.
110 YY	Illegal writing instance format	Initialisation		Collect point name YY configured in the Gateway CCN configuration table W_PT_INS has a format not allowed by the Gateway.
1 YY	Incorrect write setpoint table name	Initialisation	YY = 01 to 12 (write setpoint number into table WDEC)	Write setpoint table name YY configured in the Gateway CCN configuration table WDEC is incorrect. Verify it has been correctly spelt and verify in the interfaced controller that this table name is correct and that this table is of the type Setpoint.
2 YY	Incorrect write setpoint name	Initialisation		Write setpoint name YY configured in the Gateway CCN configuration table WDEC is incorrect. Verify it has been correctly spelt and verify in the interfaced controller that point name is correct and that it is included in the configured write setpoint table.
3 YY	Illegal write setpoint format	Initialisation		Write setpoint name YY configured in the Gateway CCN configuration table WDEC has a format not allowed by the Gateway.
4 YY	Incorrect force variable table name	Initialisation	YY = 01 to 10 (force variable number into table FVAR)	Force variable table name YY configured in the Gateway CCN configuration table FVAR is incorrect. Verify it has been correctly spelt and verify in the interfaced controller that this table name is correct and that this table is of the type Point Display.
5 YY	Incorrect force variable name	Initialisation		Force variable name YY configured in the Gateway CCN configuration table FVAR is incorrect. Verify it has been correctly spelt and verify in the interfaced controller that point name is correct and that it is included in the configured force variable table.
6 YY	Illegal force variable format	Initialisation		Force variable name YY configured in the Gateway CCN configuration table FVAR has a format not allowed by the Gateway.
7 YY	Forcing not allowed to variable	Initialisation		Forcing is not allowed with the variable YY configured in the Gateway CCN configuration table FVAR.
20	Incorrect read alarm table name	Initialisation	-	Read alarm point table name configured in the Gateway CCNCONF table is incorrect. Verify it has been correctly spelt and verify in the interfaced controller that thid table name is correct.
2 X	Incorrect read alarm point name	Initialisation	X = 1 to 5 (read alarm variable number into table CCNCONF)	Read alarm point name X configured in the Gateway CCNCONF table is incorrect. Verify it has been correctly spelt and verify in the interfaced controller that this table name is correct.
3 X	Incorrect read alarm point format	Initialisation		Read alarm point X is not of the type integer or ASCII.

GATEWAY ALARMS				
CODE	**DESCRIPTION**	**FAILURE TYPE**	**PARAMETERS DESCRIPTION**	**REMARKS**

Examples:

Code **1 2 07** (X = 2 & YY = 09) means that the collect table name **7** entered into the Gateway CCN configuration table RPOINT**2** is incorrect.

Code **2 3 05** (X = 3 & YY = 05) means that the collect name **5** entered into the Gateway CCN configuration table RPOINT**3** is incorrect.

Code **5 2 02** (Z = 2 & YY = 02) means that the instance name **2** entered into the Gateway CCN configuration table INSTANC**2** is incorrect

Code **1 03** (YY = 03) means that the write setpoint table name **3** entered into the Gateway CCN configuration table WDEC is incorrect.

Code **2 08** (YY = 08) means that the write setpoint name **8** entered into the Gateway CCN configuration table WDEC is incorrect.

Code **4 01** (YY = 01) means that the force variable table name **1** entered into the Gateway CCN configuration table FVAR is incorrect.

Code **5 03** (YY = 03) means that the force variable name **3** entered into the Gateway CCN configuration table FVAR is incorrect.

Code **8 023** (XXX = 023) means that 2 Place in Jbus selected into the gateway configuration tables 6XX_INS have to read the same instance number. One of this two Place is number 23 selected into table 6XX_INS2. The other has to be determined by the user.

Code **2 1** (X=1) means that the read alarm point name **1** entered into the gateway CCN Configuration table CCNCONF is incorrect. Be careful the label of this point is: “Alarm trigger point name” and not “Alarm read point name 1” as user could expect.

Code **20** means that the read alarm table name entered into the gateway CCN Configuration table CCNCONF is incorrect. Be careful the label of this point is “Alarm trigger table name” and not “Alarm read table name” as user could expect.

APPENDIX C

JBUS ALARMS DESCRIPTION

Below is the list of JBUS alarm codes that can be returned after a JBUS command. These are displayed through the Gateway CCN Maintenance table UPDATE or through the Gateway register 66 [h42] (JBUS off-network access).

ALARM CODE	DESCRIPTION
1	Unknown JBUS command
2	Incorrect register address
3	Incorrect data
10	Incorrect JBUS slave
11	Incorrect JBUS baud rate

APPENDIX D

ASCII STRINGS CODES

STRING	CODE
Unknown string	FFFF h
Abnormal	1
Alarm	35
Alert	36
Auto	43
Both	2
Boost HT	48
CCN	3
Close	1
Comfail	4
Config	45
Cool	0
Cool sat	49
Cool dmd	50
Cooling	0
Ctl test	5
Defrost	37
Delay	6
Demand	7
Disable	0
Emstop	2
Enable	1
Error	51
EWT	0
Failstop	8
Failstrt	9
Failed	52
False	0
Fault	10
Frost	53
Heat	1
Heating	1
High	40
Heat sat	54
Heat dmd	55
Invalid	46
Lag	11
Lead	12
Loadshed	56
Local	13
Lockout	14
Low	39
LWT	1
Master	41
Medium	57
No	0
No mode	58
None	47
Normal	0
Off	0
Open	0
On	1
Override	15
Partial	16
Pumpdown	17
Ramping	18
Ready	19

CODE	STRING
FFFF h	Unknown string
0	Cool
0	Cooling
0	Disable
0	EWT
0	False
0	No
0	Normal
0	Off
0	Open
1	Abnormal
1	Close
1	Enable
1	Heat
1	Heating
1	LWT
1	On
1	Start
1	True
1	Yes
2	Both
2	Emstop
3	Ccn
4	Comfail
5	Ctl test
6	Delay
7	Demand
8	Failstop
9	Failstrt
10	Fault
11	Lag
12	Lead
13	Local
14	Lockout
15	Override
16	Partial
17	Pumpdown
18	Ramping
19	Ready
20	Recycle
21	Remote
22	Reset
23	Prestart
24	Running
25	Shutdown
26	Standby
27	Startup
28	Stop
29	Stopping
30	Test
31	Timeout
32	Tripout
33	Retain
34	Recovery
35	Alarm
36	Alert
37	Defrost

Recycle	20
Recovery	34
Remote	21
Reset	22
Prestart	23
Retain	33
Run test	38
Running	24
Shutdown	25
Slave	42
Standard	44
Standby	26
Start	1
Startup	27
Stop	28
Stopping	29
Test	30
Timeout	31
Tripout	32
True	1
Yes	1

38	Run test
39	Low
40	High
41	Master
42	Slave
43	Auto
44	Standard
45	Config
46	Invalid
47	None
48	Boost HT
49	Cool sat
50	Cool dmd
51	Error
52	Failed
53	Frost
54	Heat sat
55	Heat dmd
56	Loadshed
57	Medium
58	No mode

20 additional strings can be added in the table STRG_DEF of the CCN/JBUS gateway. Associated codes shall be from 70 to 79 where code 70 corresponds to string 70. The Gateway shall look for all the strings in the list above and if no string matches the one from controller, it shall search from the 20 customerized strings.

Note: Gateway doesn't take care of the character type (upper or lower case) and of the lead or rightmost characters.

Warning:

If the original string exceeds 8 character length (i.e. PIC II on centrifugal chillers), the Gateway shall take only 8 first characters

This table contains native items that can be translated in any foreign language. If the controller attached to the Gateway uses items translated in a foreign language, then these items also needs to be translated (with exactly the same spelling than in the controller) in the above table.

APPENDIX E

DECIMAL TO HEXADECIMAL CONVERSION TABLE

-650	hFD76	-585	hFDB7	-520	hFDF8	-455	hFE39	-390	hFE7A	-325	hFEBB	-260	hFEFC	-195	hFF3D	-130	hFF7E	-65	hFFBF
-649	hFD77	-584	hFDB8	-519	hFDF9	-454	hFE3A	-389	hFE7B	-324	hFEBC	-259	hFEFD	-194	hFF3E	-129	hFF7F	-64	hFFC0
-648	hFD78	-583	hFDB9	-518	hFDFA	-453	hFE3B	-388	hFE7C	-323	hFEBD	-258	hFEFE	-193	hFF3F	-128	hFF80	-63	hFFC1
-647	hFD79	-582	hFDBA	-517	hFDFB	-452	hFE3C	-387	hFE7D	-322	hFEBE	-257	hFEFF	-192	hFF40	-127	hFF81	-62	hFFC2
-646	hFD7A	-581	hFDBB	-516	hFDFC	-451	hFE3D	-386	hFE7E	-321	hFEBF	-256	hFF00	-191	hFF41	-126	hFF82	-61	hFFC3
-645	hFD7B	-580	hFDBC	-515	hFDFD	-450	hFE3E	-385	hFE7F	-320	hFEC0	-255	hFF01	-190	hFF42	-125	hFF83	-60	hFFC4
-644	hFD7C	-579	hFDBD	-514	hFDFE	-449	hFE3F	-384	hFE80	-319	hFEC1	-254	hFF02	-189	hFF43	-124	hFF84	-59	hFFC5
-643	hFD7D	-578	hFDBE	-513	hFDFF	-448	hFE40	-383	hFE81	-318	hFEC2	-253	hFF03	-188	hFF44	-123	hFF85	-58	hFFC6
-642	hFD7E	-577	hFDBF	-512	hFE00	-447	hFE41	-382	hFE82	-317	hFEC3	-252	hFF04	-187	hFF45	-122	hFF86	-57	hFFC7
-641	hFD7F	-576	hFDC0	-511	hFE01	-446	hFE42	-381	hFE83	-316	hFEC4	-251	hFF05	-186	hFF46	-121	hFF87	-56	hFFC8
-640	hFD80	-575	hFDC1	-510	hFE02	-445	hFE43	-380	hFE84	-315	hFEC5	-250	hFF06	-185	hFF47	-120	hFF88	-55	hFFC9
-639	hFD81	-574	hFDC2	-509	hFE03	-444	hFE44	-379	hFE85	-314	hFEC6	-249	hFF07	-184	hFF48	-119	hFF89	-54	hFFCA
-638	hFD82	-573	hFDC3	-508	hFE04	-443	hFE45	-378	hFE86	-313	hFEC7	-248	hFF08	-183	hFF49	-118	hFF8A	-53	hFFCB
-637	hFD83	-572	hFDC4	-507	hFE05	-442	hFE46	-377	hFE87	-312	hFEC8	-247	hFF09	-182	hFF4A	-117	hFF8B	-52	hFFCC
-636	hFD84	-571	hFDC5	-506	hFE06	-441	hFE47	-376	hFE88	-311	hFEC9	-246	hFF0A	-181	hFF4B	-116	hFF8C	-51	hFFCD
-635	hFD85	-570	hFDC6	-505	hFE07	-440	hFE48	-375	hFE89	-310	hFECA	-245	hFF0B	-180	hFF4C	-115	hFF8D	-50	hFFCE
-634	hFD86	-569	hFDC7	-504	hFE08	-439	hFE49	-374	hFE8A	-309	hFECB	-244	hFF0C	-179	hFF4D	-114	hFF8E	-49	hFFCF
-633	hFD87	-568	hFDC8	-503	hFE09	-438	hFE4A	-373	hFE8B	-308	hFECC	-243	hFF0D	-178	hFF4E	-113	hFF8F	-48	hFFD0
-632	hFD88	-567	hFDC9	-502	hFE0A	-437	hFE4B	-372	hFE8C	-307	hFECD	-242	hFF0E	-177	hFF4F	-112	hFF90	-47	hFFD1
-631	hFD89	-566	hFDCA	-501	hFE0B	-436	hFE4C	-371	hFE8D	-306	hFECE	-241	hFF0F	-176	hFF50	-111	hFF91	-46	hFFD2
-630	hFD8A	-565	hFDCB	-500	hFE0C	-435	hFE4D	-370	hFE8E	-305	hFECF	-240	hFF10	-175	hFF51	-110	hFF92	-45	hFFD3
-629	hFD8B	-564	hFDCC	-499	hFE0D	-434	hFE4E	-369	hFE8F	-304	hFED0	-239	hFF11	-174	hFF52	-109	hFF93	-44	hFFD4
-628	hFD8C	-563	hFDCD	-498	hFE0E	-433	hFE4F	-368	hFE90	-303	hFED1	-238	hFF12	-173	hFF53	-108	hFF94	-43	hFFD5
-627	hFD8D	-562	hFDCE	-497	hFE0F	-432	hFE50	-367	hFE91	-302	hFED2	-237	hFF13	-172	hFF54	-107	hFF95	-42	hFFD6
-626	hFD8E	-561	hFDCF	-496	hFE10	-431	hFE51	-366	hFE92	-301	hFED3	-236	hFF14	-171	hFF55	-106	hFF96	-41	hFFD7
-625	hFD8F	-560	hFDD0	-495	hFE11	-430	hFE52	-365	hFE93	-300	hFED4	-235	hFF15	-170	hFF56	-105	hFF97	-40	hFFD8
-624	hFD90	-559	hFDD1	-494	hFE12	-429	hFE53	-364	hFE94	-299	hFED5	-234	hFF16	-169	hFF57	-104	hFF98	-39	hFFD9
-623	hFD91	-558	hFDD2	-493	hFE13	-428	hFE54	-363	hFE95	-298	hFED6	-233	hFF17	-168	hFF58	-103	hFF99	-38	hFFDA
-622	hFD92	-557	hFDD3	-492	hFE14	-427	hFE55	-362	hFE96	-297	hFED7	-232	hFF18	-167	hFF59	-102	hFF9A	-37	hFFDB
-621	hFD93	-556	hFDD4	-491	hFE15	-426	hFE56	-361	hFE97	-296	hFED8	-231	hFF19	-166	hFF5A	-101	hFF9B	-36	hFFDC
-620	hFD94	-555	hFDD5	-490	hFE16	-425	hFE57	-360	hFE98	-295	hFED9	-230	hFF1A	-165	hFF5B	-100	hFF9C	-35	hFFDD
-619	hFD95	-554	hFDD6	-489	hFE17	-424	hFE58	-359	hFE99	-294	hFEDA	-229	hFF1B	-164	hFF5C	-99	hFF9D	-34	hFFDE
-618	hFD96	-553	hFDD7	-488	hFE18	-423	hFE59	-358	hFE9A	-293	hFEDB	-228	hFF1C	-163	hFF5D	-98	hFF9E	-33	hFFDF
-617	hFD97	-552	hFDD8	-487	hFE19	-422	hFE5A	-357	hFE9B	-292	hFEDC	-227	hFF1D	-162	hFF5E	-97	hFF9F	-32	hFFE0
-616	hFD98	-551	hFDD9	-486	hFE1A	-421	hFE5B	-356	hFE9C	-291	hFEDD	-226	hFF1E	-161	hFF5F	-96	hFFA0	-31	hFFE1
-615	hFD99	-550	hFDDA	-485	hFE1B	-420	hFE5C	-355	hFE9D	-290	hFEDE	-225	hFF1F	-160	hFF60	-95	hFFA1	-30	hFFE2
-614	hFD9A	-549	hFDDB	-484	hFE1C	-419	hFE5D	-354	hFE9E	-289	hFEDF	-224	hFF20	-159	hFF61	-94	hFFA2	-29	hFFE3
-613	hFD9B	-548	hFDDC	-483	hFE1D	-418	hFE5E	-353	hFE9F	-288	hFEE0	-223	hFF21	-158	hFF62	-93	hFFA3	-28	hFFE4
-612	hFD9C	-547	hFDDD	-482	hFE1E	-417	hFE5F	-352	hFEA0	-287	hFEE1	-222	hFF22	-157	hFF63	-92	hFFA4	-27	hFFE5
-611	hFD9D	-546	hFDDE	-481	hFE1F	-416	hFE60	-351	hFEA1	-286	hFEE2	-221	hFF23	-156	hFF64	-91	hFFA5	-26	hFFE6
-610	hFD9E	-545	hFDDF	-480	hFE20	-415	hFE61	-350	hFEA2	-285	hFEE3	-220	hFF24	-155	hFF65	-90	hFFA6	-25	hFFE7
-609	hFD9F	-544	hFDE0	-479	hFE21	-414	hFE62	-349	hFEA3	-284	hFEE4	-219	hFF25	-154	hFF66	-89	hFFA7	-24	hFFE8
-608	hFDA0	-543	hFDE1	-478	hFE22	-413	hFE63	-348	hFEA4	-283	hFEE5	-218	hFF26	-153	hFF67	-88	hFFA8	-23	hFFE9
-607	hFDA1	-542	hFDE2	-477	hFE23	-412	hFE64	-347	hFEA5	-282	hFEE6	-217	hFF27	-152	hFF68	-87	hFFA9	-22	hFFEA
-606	hFDA2	-541	hFDE3	-476	hFE24	-411	hFE65	-346	hFEA6	-281	hFEE7	-216	hFF28	-151	hFF69	-86	hFFAA	-21	hFFEB
-605	hFDA3	-540	hFDE4	-475	hFE25	-410	hFE66	-345	hFEA7	-280	hFEE8	-215	hFF29	-150	hFF6A	-85	hFFAB	-20	hFFEC
-604	hFDA4	-539	hFDE5	-474	hFE26	-409	hFE67	-344	hFEA8	-279	hFEE9	-214	hFF2A	-149	hFF6B	-84	hFFAC	-19	hFFED
-603	hFDA5	-538	hFDE6	-473	hFE27	-408	hFE68	-343	hFEA9	-278	hFEEA	-213	hFF2B	-148	hFF6C	-83	hFFAD	-18	hFFEE
-602	hFDA6	-537	hFDE7	-472	hFE28	-407	hFE69	-342	hFEAA	-277	hFEEB	-212	hFF2C	-147	hFF6D	-82	hFFAE	-17	hFFEF
-601	hFDA7	-536	hFDE8	-471	hFE29	-406	hFE6A	-341	hFEAB	-276	hFEEC	-211	hFF2D	-146	hFF6E	-81	hFFAF	-16	hFFF0
-600	hFDA8	-535	hFDE9	-470	hFE2A	-405	hFE6B	-340	hFEAC	-275	hFEED	-210	hFF2E	-145	hFF6F	-80	hFFB0	-15	hFFF1
-599	hFDA9	-534	hFDEA	-469	hFE2B	-404	hFE6C	-339	hFEAD	-274	hFEEE	-209	hFF2F	-144	hFF70	-79	hFFB1	-14	hFFF2
-598	hFDAA	-533	hFDEB	-468	hFE2C	-403	hFE6D	-338	hFEAE	-273	hFEEF	-208	hFF30	-143	hFF71	-78	hFFB2	-13	hFFF3
-597	hFDAB	-532	hFDEC	-467	hFE2D	-402	hFE6E	-337	hFEAF	-272	hFEF0	-207	hFF31	-142	hFF72	-77	hFFB3	-12	hFFF4
-596	hFDAC	-531	hFDED	-466	hFE2E	-401	hFE6F	-336	hFEB0	-271	hFEF1	-206	hFF32	-141	hFF73	-76	hFFB4	-11	hFFF5
-595	hFDAD	-530	hFDEE	-465	hFE2F	-400	hFE70	-335	hFEB1	-270	hFEF2	-205	hFF33	-140	hFF74	-75	hFFB5	-10	hFFF6
-594	hFDAE	-529	hFDEF	-464	hFE30	-399	hFE71	-334	hFEB2	-269	hFEF3	-204	hFF34	-139	hFF75	-74	hFFB6	-9	hFFF7
-593	hFDAF	-528	hFDF0	-463	hFE31	-398	hFE72	-333	hFEB3	-268	hFEF4	-203	hFF35	-138	hFF76	-73	hFFB7	-8	hFFF8
-592	hFDB0	-527	hFDF1	-462	hFE32	-397	hFE73	-332	hFEB4	-267	hFEF5	-202	hFF36	-137	hFF77	-72	hFFB8	-7	hFFF9
-591	hFDB1	-526	hFDF2	-461	hFE33	-396	hFE74	-331	hFEB5	-266	hFEF6	-201	hFF37	-136	hFF78	-71	hFFB9	-6	hFFFA
-590	hFDB2	-525	hFDF3	-460	hFE34	-395	hFE75	-330	hFEB6	-265	hFEF7	-200	hFF38	-135	hFF79	-70	hFFBA	-5	hFFFB
-589	hFDB3	-524	hFDF4	-459	hFE35	-394	hFE76	-329	hFEB7	-264	hFEF8	-199	hFF39	-134	hFF7A	-69	hFFBB	-4	hFFFC
-588	hFDB4	-523	hFDF5	-458	hFE36	-393	hFE77	-328	hFEB8	-263	hFEF9	-198	hFF3A	-133	hFF7B	-68	hFFBC	-3	hFFFD
-587	hFDB5	-522	hFDF6	-457	hFE37	-392	hFE78	-327	hFEB9	-262	hFEFA	-197	hFF3B	-132	hFF7C	-67	hFFBD	-2	hFFFE
-586	hFDB6	-521	hFDF7	-456	hFE38	-391	hFE79	-326	hFEBA	-261	hFEFB	-196	hFF3C	-131	hFF7D	-66	hFFBE	-1	hFFFF

DECIMAL TO HEXADECIMAL CONVERSION TABLE (continued)

1	h1	66	h42	131	h83	196	hC4	261	h105	326	h146	391	h187	456	h1C8	521	h209	586	h24A
2	h2	67	h43	132	h84	197	hC5	262	h106	327	h147	392	h188	457	h1C9	522	h20A	587	h24B
3	h3	68	h44	133	h85	198	hC6	263	h107	328	h148	393	h189	458	h1CA	523	h20B	588	h24C
4	h4	69	h45	134	h86	199	hC7	264	h108	329	h149	394	h18A	459	h1CB	524	h20C	589	h24D
5	h5	70	h46	135	h87	200	hC8	265	h109	330	h14A	395	h18B	460	h1CC	525	h20D	590	h24E
6	h6	71	h47	136	h88	201	hC9	266	h10A	331	h14B	396	h18C	461	h1CD	526	h20E	591	h24F
7	h7	72	h48	137	h89	202	hCA	267	h10B	332	h14C	397	h18D	462	h1CE	527	h20F	592	h250
8	h8	73	h49	138	h8A	203	hCB	268	h10C	333	h14D	398	h18E	463	h1CF	528	h210	593	h251
9	h9	74	h4A	139	h8B	204	hCC	269	h10D	334	h14E	399	h18F	464	h1D0	529	h211	594	h252
10	hA	75	h4B	140	h8C	205	hCD	270	h10E	335	h14F	400	h190	465	h1D1	530	h212	595	h253
11	hB	76	h4C	141	h8D	206	hCE	271	h10F	336	h150	401	h191	466	h1D2	531	h213	596	h254
12	hC	77	h4D	142	h8E	207	hCF	272	h110	337	h151	402	h192	467	h1D3	532	h214	597	h255
13	hD	78	h4E	143	h8F	208	hD0	273	h111	338	h152	403	h193	468	h1D4	533	h215	598	h256
14	hE	79	h4F	144	h90	209	hD1	274	h112	339	h153	404	h194	469	h1D5	534	h216	599	h257
15	hF	80	h50	145	h91	210	hD2	275	h113	340	h154	405	h195	470	h1D6	535	h217	600	h258
16	h10	81	h51	146	h92	211	hD3	276	h114	341	h155	406	h196	471	h1D7	536	h218	601	h259
17	h11	82	h52	147	h93	212	hD4	277	h115	342	h156	407	h197	472	h1D8	537	h219	602	h25A
18	h12	83	h53	148	h94	213	hD5	278	h116	343	h157	408	h198	473	h1D9	538	h21A	603	h25B
19	h13	84	h54	149	h95	214	hD6	279	h117	344	h158	409	h199	474	h1DA	539	h21B	604	h25C
20	h14	85	h55	150	h96	215	hD7	280	h118	345	h159	410	h19A	475	h1DB	540	h21C	605	h25D
21	h15	86	h56	151	h97	216	hD8	281	h119	346	h15A	411	h19B	476	h1DC	541	h21D	606	h25E
22	h16	87	h57	152	h98	217	hD9	282	h11A	347	h15B	412	h19C	477	h1DD	542	h21E	607	h25F
23	h17	88	h58	153	h99	218	hDA	283	h11B	348	h15C	413	h19D	478	h1DE	543	h21F	608	h260
24	h18	89	h59	154	h9A	219	hDB	284	h11C	349	h15D	414	h19E	479	h1DF	544	h220	609	h261
25	h19	90	h5A	155	h9B	220	hDC	285	h11D	350	h15E	415	h19F	480	h1E0	545	h221	610	h262
26	h1A	91	h5B	156	h9C	221	hDD	286	h11E	351	h15F	416	h1A0	481	h1E1	546	h222	611	h263
27	h1B	92	h5C	157	h9D	222	hDE	287	h11F	352	h160	417	h1A1	482	h1E2	547	h223	612	h264
28	h1C	93	h5D	158	h9E	223	hDF	288	h120	353	h161	418	h1A2	483	h1E3	548	h224	613	h265
29	h1D	94	h5E	159	h9F	224	hE0	289	h121	354	h162	419	h1A3	484	h1E4	549	h225	614	h266
30	h1E	95	h5F	160	hA0	225	hE1	290	h122	355	h163	420	h1A4	485	h1E5	550	h226	615	h267
31	h1F	96	h60	161	hA1	226	hE2	291	h123	356	h164	421	h1A5	486	h1E6	551	h227	616	h268
32	h20	97	h61	162	hA2	227	hE3	292	h124	357	h165	422	h1A6	487	h1E7	552	h228	617	h269
33	h21	98	h62	163	hA3	228	hE4	293	h125	358	h166	423	h1A7	488	h1E8	553	h229	618	h26A
34	h22	99	h63	164	hA4	229	hE5	294	h126	359	h167	424	h1A8	489	h1E9	554	h22A	619	h26B
35	h23	100	h64	165	hA5	230	hE6	295	h127	360	h168	425	h1A9	490	h1EA	555	h22B	620	h26C
36	h24	101	h65	166	hA6	231	hE7	296	h128	361	h169	426	h1AA	491	h1EB	556	h22C	621	h26D
37	h25	102	h66	167	hA7	232	hE8	297	h129	362	h16A	427	h1AB	492	h1EC	557	h22D	622	h26E
38	h26	103	h67	168	hA8	233	hE9	298	h12A	363	h16B	428	h1AC	493	h1ED	558	h22E	623	h26F
39	h27	104	h68	169	hA9	234	hEA	299	h12B	364	h16C	429	h1AD	494	h1EE	559	h22F	624	h270
40	h28	105	h69	170	hAA	235	hEB	300	h12C	365	h16D	430	h1AE	495	h1EF	560	h230	625	h271
41	h29	106	h6A	171	hAB	236	hEC	301	h12D	366	h16E	431	h1AF	496	h1F0	561	h231	626	h272
42	h2A	107	h6B	172	hAC	237	hED	302	h12E	367	h16F	432	h1B0	497	h1F1	562	h232	627	h273
43	h2B	108	h6C	173	hAD	238	hEE	303	h12F	368	h170	433	h1B1	498	h1F2	563	h233	628	h274
44	h2C	109	h6D	174	hAE	239	hEF	304	h130	369	h171	434	h1B2	499	h1F3	564	h234	629	h275
45	h2D	110	h6E	175	hAF	240	hF0	305	h131	370	h172	435	h1B3	500	h1F4	565	h235	630	h276
46	h2E	111	h6F	176	hB0	241	hF1	306	h132	371	h173	436	h1B4	501	h1F5	566	h236	631	h277
47	h2F	112	h70	177	hB1	242	hF2	307	h133	372	h174	437	h1B5	502	h1F6	567	h237	632	h278
48	h30	113	h71	178	hB2	243	hF3	308	h134	373	h175	438	h1B6	503	h1F7	568	h238	633	h279
49	h31	114	h72	179	hB3	244	hF4	309	h135	374	h176	439	h1B7	504	h1F8	569	h239	634	h27A
50	h32	115	h73	180	hB4	245	hF5	310	h136	375	h177	440	h1B8	505	h1F9	570	h23A	635	h27B
51	h33	116	h74	181	hB5	246	hF6	311	h137	376	h178	441	h1B9	506	h1FA	571	h23B	636	h27C
52	h34	117	h75	182	hB6	247	hF7	312	h138	377	h179	442	h1BA	507	h1FB	572	h23C	637	h27D
53	h35	118	h76	183	hB7	248	hF8	313	h139	378	h17A	443	h1BB	508	h1FC	573	h23D	638	h27E
54	h36	119	h77	184	hB8	249	hF9	314	h13A	379	h17B	444	h1BC	509	h1FD	574	h23E	639	h27F
55	h37	120	h78	185	hB9	250	hFA	315	h13B	380	h17C	445	h1BD	510	h1FE	575	h23F	640	h280
56	h38	121	h79	186	hBA	251	hFB	316	h13C	381	h17D	446	h1BE	511	h1FF	576	h240	641	h281
57	h39	122	h7A	187	hBB	252	hFC	317	h13D	382	h17E	447	h1BF	512	h200	577	h241	642	h282
58	h3A	123	h7B	188	hBC	253	hFD	318	h13E	383	h17F	448	h1C0	513	h201	578	h242	643	h283
59	h3B	124	h7C	189	hBD	254	hFE	319	h13F	384	h180	449	h1C1	514	h202	579	h243	644	h284
60	h3C	125	h7D	190	hBE	255	hFF	320	h140	385	h181	450	h1C2	515	h203	580	h244	645	h285
61	h3D	126	h7E	191	hBF	256	h100	321	h141	386	h182	451	h1C3	516	h204	581	h245	646	h286
62	h3E	127	h7F	192	hC0	257	h101	322	h142	387	h183	452	h1C4	517	h205	582	h246	647	h287
63	h3F	128	h80	193	hC1	258	h102	323	h143	388	h184	453	h1C5	518	h206	583	h247	648	h288
64	h40	129	h81	194	hC2	259	h103	324	h144	389	h185	454	h1C6	519	h207	584	h248	649	h289
65	h41	130	h82	195	hC3	260	h104	325	h145	390	h186	455	h1C7	520	h208	585	h249	650	h28A