Domotique

Secant

Home Automation

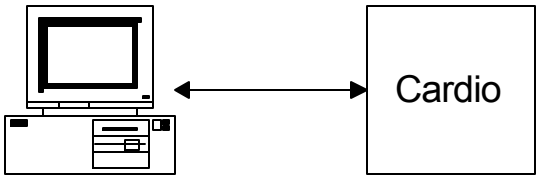
Communication Protocol Secant 2 Specification

Rev 1.0

January 2003

Introduction

This document describes the communication protocol used to exchange information between Cardio and any other peripheral (like a PC) using an RS-232 serial communication link.



Link specification

Protocol type	ASCII (text)
Link type	RS-232
Speed	9600 bauds
Start bit	1
Data bits	8
Parity	None

Exchanges description

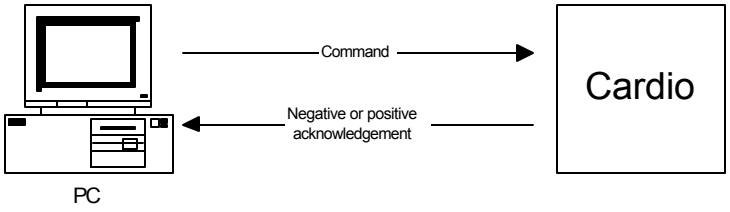
Exchanges done using the Secant 2 communication protocol are master-to-master type. Each end of the link (Cardio or the PC) can decide to send information without any explicit request from the other side. Cardio uses this feature to signal changes each time a new event occurs.

There are 3 types of exchanges.

1. Modification request from PC to Cardio.
2. Information request from PC to Cardio.
3. Event signalled from Cardio to PC.

Modification request from PC to Cardio.

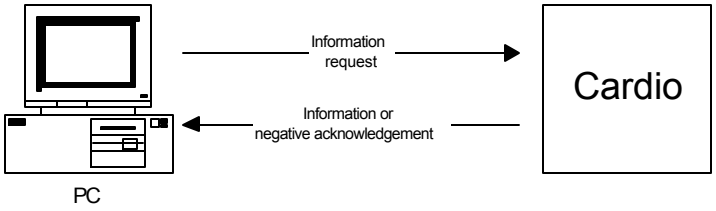
When the PC needs to change state of an object control by Cardio (lighting, appliance, ...), it must send a modification command to Cardio. Cardio will then answer with a positive (Ack) or negative (Nack) acknowledgement. This acknowledgement indicate to the sender if the command succeed or failed. If the command failed, an error code is sent by Cardio to indicate the reason. Error codes are described later in this document (section “Transactions acknowledgement”).



Modification request from PC to Cardio

Information request from PC to Cardio.

When the PC wants to get the state of an object controlled by Cardio, it must send an information request to Cardio. Cardio will then answer with the information request or with a negative acknowledgement if the command is not correct.

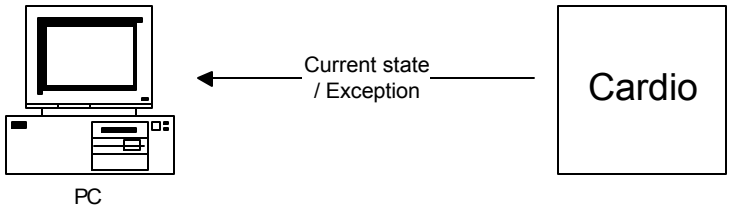


Information request from PC to Cardio

Event signalled from Cardio to PC.

When the state of an object controlled by Cardio changes, Cardio sends an exception transaction to inform the PC. For example, if the security is armed, Cardio will send an exception transaction to inform the PC that the security is now armed.

Exception transactions are the same transactions that are sent when the PC sends an information request.



Exception transaction

General format for transactions

All transactions share the same structure. The first two characters indicate the start (@) of the transaction and the type (S,G,I) of transaction, following these two characters we find the object type and the specific information for each transaction. All fields of a transaction are separated using one and only one space.

@C T O P1 P2 ... PN?

Generic transaction format

@ *- Start of transaction indicator*

The symbol "@" is used to indicate the start of a new transaction. On reception of this symbol, the receiver must forget any in-progress transaction (if so) and start a new one.

C - Transaction type

There are five types of transactions recognize by Cardio.

Transaction type description	Symbol
To change object state (Set).	S
To get object state (Get).	G
To signal acceptation of a transaction (Ack).	A
To signal the refusal of a transaction (Nack).	N
To signal state change of an object (Information).	I

T - Object type.

All transactions are used to change, to signal changes or to get the state of an object controlled by Cardio. There are 10 types of object controlled by Cardio.

Object type	Symbol
Lighting	L
Relay	R
Heating/Cooling	H
Temperature	T
Date and time	D
Scenario	M
Security	S
Zones	Z
Zones bypass	B
Login/Logout	P

O - Object number.

Object number is used to indicate which object when there are more than one. This number is used in most transactions.

P1, P2, … Pn – Transaction parameters.

Number of parameters and their meaning are different for each type of transaction. Parameter description is done in the section that describes each transaction in detail.

? - *End of transaction character.*

All transactions are ended with a carriage return (0x0D). Upon receiving of this character, the receiver can start analyzing the transaction syntax and, if the transaction is valid, take the appropriate actions.

Transactions acknowledgement

When Cardio receives a transaction with all parameters valid, it answers with a positive acknowledgement (Ack).

@A t o

@	Start of transaction.
A	Positive Acknowledgment (Ack).
t	Object type corresponding with the command.
o	**If applicable**, object number.
?	End of transaction character.

When Cardio receives a transaction with an invalid parameter, it refuses the transaction and sends back a negative acknowledgement (Nack).

@N t o c

@	Start of transaction.
N	Negative acknowledgement (Nack).
t	Object type corresponding with the command.
o	**If applicable**, object number.
c	Error code describing why Cardio refuse the transaction.
?	End of transaction character.

The following table describe each error codes send by Cardio.

Error code description	Code
Object type specified by the transaction is not recognized.	1
Object number is out of range for the object type specified. For example, if the maximum lighting channels are 160 and if the transaction asks to open channel 161, Cardio will answer with the transaction @N L 161 2.	2
One or more parameters are not valid. For example, asking to change temperature of the zone 1 to 400 degrees is not valid.	3
Security code is not valid.	4
Transaction S (Set) not supported for the requested type of object.	5
Transaction G (Get) not supported for the requested type of object.	6
Transaction is refused because security is armed.	7
This zone can be ignored.	8
Security can not be armed because there are open zones.	16
Security can not be armed because there is a power problem.	17
Security can not be armed for an unknown reason.	18

Transactions description

The following paragraphs describes each transaction for each type of object supported by Cardio.

Lighting

This transaction is used to control channel intensity.

To change lighting intensity (PC to Cardio).

@S L o d

@	Start of transaction.
S	Transaction to change setting.
L	Light command.
o	Light channel number that we want to change intensity.
d	Intensity wanted. This parameter must be an integer number between 0 and 100.
?	End of transaction character.

To get channel intensity (PC to Cardio).

@G L o

@	Start of transaction.
G	Transaction to get state.
L	Light command.
o	Light number.
?	End of transaction character.

To signal light changes (Cardio to PC).

@I L o d

@	Start of transaction.
I	Transaction to signal changes or to answer a state request.
L	Light command.
o	Light number.
d	Light intensity.
?	End of transaction character.

Exchange examples :

To open lighting channel number 1 at 100%.

	PC	Cardio
Command.	@S L 1 100	
Acknowledgement of the command.		@A L 1
Exception to signal that the lighting channel 1 is now at 100%.		@I L 1 100

To close lighting channel number 4.

	PC	Cardio
Command.	@S L 4 0	
Acknowledgement of the command.		@A L 4
Channel 4 is now at 0%.		@I L 4 0

To get intensity of the lighting channel number 121.

	PC	Cardio
Command.	@G L 121	
Channel 121 is at 40%.		@I L 121 40

Cardio signal intensity change (80%) on lighting channel 46.

	PC	Cardio
Channel 46 is now at 80%.		@I L 46 80

Relays

This transaction is used to control Cardio relays (appliances).

To change relay state (PC to Cardio).

@S R o s

@	Start of transaction.
S	Transaction to change setting.
R	Relay command.
o	Relay number.
s	The desired state. O – Open C – Close
?	End of transaction character.

To get relay state (PC to Cardio).

@G R o

@	Start of transaction.
G	Transaction to get state.
R	Relay command.
o	Relay number.
?	End of transaction character.

To signal relay changes (Cardio to PC).

@I R o s

@	Start of transaction.
I	Transaction to signal changes or to answer a state request.
R	Relay command.
o	Relay number.
s	Relay state. O – Open C – Close
?	End of transaction character.

Exchange examples :

To close relay number 2.

	PC	Cardio
Command.	@S R 2 C	
Acknowledgement of the command.		@A R 2
Relay 2 is now closed.		@I R 2 C

To get state of relay 1.

	PC	Cardio
Command.	@G R 1	
Relay 1 is closed.		@I R 1 C

Cardio signal changes on relay 4 that has just opened.

	PC	Cardio
Relay 4 is open.		@I R 4 O

Temperature control

This transaction is used to control temperature of a desired HVAC zone.

To change HVAC settings (PC to Cardio).

@S H o h c f m

- @ Start of transaction.
- S Transaction to change setting.
- H Heating/cooling command.
- o Zone number.
- h Heating set point.
- c Cooling set point.
- f Fan state :
  - S – Stop
  - R – Running
- m System mode :
  - A – Auto
  - H – Heating
  - C – Cooling
  - O – Off
  - E – Economy
  - N – Normal
- ? End of transaction character.

To get HVAC settings (PC to Cardio).

@G H o

- @ Start of transaction.
- G Transaction to get state.
- H Heating/cooling command.
- o Zone number.
- ? End of transaction character.

To signal HVAC changes (Cardio to PC).

@I H o h c f m

- @ Start of transaction.
- I Transaction to signal changes or to answer a state request.
- H Heating/cooling command.
- o Zone number.
- h Heating set point.
- c Cooling set point.
- f Fan state :
  - S – Stop
  - R – Running
- m System mode :

A – Auto
H – Heating
C – Cooling
O – Off
E – Economy
N – Normal

? End of transaction character.

Exchange examples :

To change HVAC settings for zone number 2.

	PC	Cardio
Command Heat set point at 21° Cool set point at 25 ° Fan stopped Automatic mode	@S H 2 21 25 S A	
Acknowledgement of the command.		@A H 2
New settings are accepted.		@I H 2 21 25 S A

To get HVAC setting for zone number 1.

	PC	Cardio
Command.	@G H 1	
Current setting for zone 1.		@I H 1 21 25 S A

Temperature

This transaction is used to get temperature and current HVAC system state.

To get temperature (PC to Cardio).

@G T o

@	Start of transaction.
G	Transaction to get state.
T	Temperature command.
o	Zone number.
?	End of transaction character.

To signal temperature changes (Cardio to PC).

@I T o d s

@	Start of transaction.
I	Transaction to signal changes or to answer a state request.
T	Temperature command.
o	Zone number.
d	Current temperature.
s	Current state of the system : H – Heating C – Cooling O – Off
?	End of transaction character.

Exchange examples :

To get temperature for the zone number 1.

	PC	Cardio
Command.	@G T 1	
Acknowledgement of the command.		@A T 1
Current temperature for the zone 1 is 21 degrees and the system has stopped.		@I T 1 21 O

Cardio signal changes for zone number 2.

	PC	Cardio
Current temperature of the zone number 2 is 22 degrees and the system is currently heating.		@I T 2 22 H

Date and time

This transaction is used to control the date and time of Cardio.

To get current date and time (PC to Cardio).

@S D yyyymmddhhmm

@	Start of transaction.
S	Transaction to change setting.
D	Date and time transaction.
yyyy	Year with millennium.
mm	Month (1..12)
dd	Day (1..31)
hh	Hour (0..23)
mm	Minute (0..59)
?	End of transaction character.

To get date and time (PC to Cardio).

@G D

@	Start of transaction.
G	Transaction to get state.
D	Date and time transaction.
?	End of transaction character.

To signal date and time (Cardio to PC).

@I D yyyymmddhhmm

@	Start of transaction.
I	Transaction to signal changes or to answer a state request.
D	Date and time transaction.
yyyy	Year with millennium.
mm	Month (1..12)
dd	Day (1..31)
hh	Hour (0..23)
mm	Minute (0..59)
?	End of transaction character.

Exchange examples :

To change date and time.

	PC	Cardio
Command.	@S D 20030814010203	
Acknowledgement of the command.		@A D

To get date and time from Cardio.

	PC	Cardio
Command.	@G D	
Current date and time.		@I D 20030814010203

Scenario

This transaction is used to activate a scenario.

To start a scenario (PC to Cardio).

@S M o [c…c]

@	Start of transaction.
S	Transaction to change setting.
M	Scenario (macro) command.
o	Scenario number.
c…c	This field is optional and only required if the scenario contains security action. In this case, this field must be a valid security code.
?	End of transaction character.

Exchange examples :

To start the scenario number 2.

	PC	Cardio
Command	@S M 2	
Acknowledgement of the command.		@A M 2

To start the scenario number 3 that contains security action.

	PC	Cardio
Command	@S M 3 12345	
Acknowledgement of the command.		@A M 3

Security

This transaction is used to control security.

To change security state. (PC to Cardio).

@S S o s c…c

@	Start of transaction.
S	Transaction to change setting.
S	Security command.
o	This field must always be 1.
s	Desired state : A – Arm; D – Disarm.
c…c	Security code.
?	End of transaction character.

To get security state (PC to Cardio).

@G S o

@	Start of transaction.
G	Transaction to get state.
S	Security command.
o	This field must always be 1.
?	End of transaction character.

To signal security changes (Cardio to PC).

@I S o s

@	Start of transaction.
I	Transaction to signal changes or to answer a state request.
S	Security command.
o	This field must always be 1.
s	Current state of the security system : A – Arm; D – Disarm.
?	End of transaction character.

Exchange examples :

To arm the security system.

	PC	Cardio
Command	@S S 1 A	
Acknowledgement of the command.		@A S 1
Security is now armed.		@I S 1 A

To get security system state.

	PC	Cardio
Command	@G S 1	
Security is disarmed.		@I S 1 D

Cardio signal security state.

	PC	Cardio
Security is armed.		@I S 1 D

Zones

This transaction is used to get the alarm zones states. If the number of zones is more than the transaction size, the PC can request the rest by sending a new transaction with a different starting zone number.

To get alarm zone state (PC to Cardio).

@G Z o

@	Start of transaction.
G	Transaction to get state.
Z	Zone command.
o	Number of the first zone to get.
?	End of transaction character.

To signal alarm zone changes (Cardio to PC).

@I Z o s…s

@	Start of transaction.
I	Transaction to signal changes or to answer a state request.
Z	Zone command.
o	Number of the first zone.
s…s	State of one or more zones. Possible states are : N = Normal O = Opened C = Closed E = Error
?	End of transaction character.

Exchange examples :

To get zone state for zone number 5.

	PC	Cardio
Command.	@G Z 5	
Zone states (first state is the state of zone 5).		@I Z 5 CNNOC

Cardio signal zone changes.

	PC	Cardio
Zone number 4 just opened.		@I Z 4 O

Zone bypass

This transaction can be used to bypass alarm zones before arming security.

To bypass zones (PC to Cardio).

@S B o s…s

@	Start of transaction.
S	Transaction to change setting.
B	Bypass state command.
o	Number of the first zone. As the number of zones can exceed the maximum size of a transaction, this transaction can be sent again using a different starting zone number.
s…s	Bypass state for one or more zones (starting with the first zone specified). Y – Must be bypassed; N – Must not be bypassed.
?	End of transaction character.

To get zone bypassing state (PC to Cardio).

@G B o

@	Start of transaction.
B	Bypass command.
o	Number of the first zone. As the number of zones can exceed the maximum size of a transaction, this transaction can be sent again using a different starting zone number.
?	End of transaction character.

To signal zone bypassing state (Cardio to PC).

@I B o s…s

@	Start of transaction.
I	Transaction to signal changes or to answer a state request.
B	Bypass command.
o	Zone number of the first zone.
s…s	Bypass state for one or more zones (starting with the first zone specified). Y – Must be bypassed; N – Must not be bypassed.
?	End of transaction character.

Exchange examples :

To bypass zones 3, 4 et 5

	PC	Cardio
Command.	@S B 3 YYY	
Acknowledgement of the command.		@A B 3

To get bypassing state for zone number 4.

	PC	Cardio
Command.	@G B 4	
Bypassing state (the first state is for zone number 4).		@I B 4 YNYYN

Cardio signal bypass changes on zone number 5.

	PC	Cardio
Zone 5 is not bypassed.		@I Z 5 N

Login

This transaction can be used to get a status update of all objects controlled by Cardio. Following a valid login command, Cardio will transmit its version automatically as well as the current state of all the objects which are under its control.

To do a login (PC to Cardio).

@S P c [p…p]

@	Start of transaction.
S	Transaction to change setting.
P	Login (password).
c	Indicate if it is a login or logout :
	I = Login;
	O = Logout (obsolete).
p…p	Must be a valid user or installer programming code.
?	End of transaction character.

Exchange examples :

To do a login command.

	PC	Cardio
Command	@S P I 11111	
Acknowledgement of the command.		@A P

NOTE
This transaction works differently for Cardio firmware before release 2.4-512.