BUILDING AUTOMATION

LonServer

Field Database Manager

User's Manual

Application Program LSRVM03 – November 2001

Important Notice

Publications

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Introduction

The LonSever is a powerful host-based LONWORKS® node specialized in the distributed Field Database (FDB) management. Its primary application is as Access Control Management Unit for up to 8 Gate Controllers in Apice's Globe2000 Access Control System.

The LonServer receives information from the IOL222 Gate Controllers and JLON Identification Units containing the user's identification data (badge number and/or PIN code), checks the database stored in the on-board memory to understand whether the access must be granted and sends appropriate commands to the Gate Controllers to unlock the protected gates.

Every transit occurred in any of the controlled gates will be retained locally in the FDB until the alignment of the distributed FBD and the Local Database (LDB) stored in the Central Management Computer is reached.

The alignment of the distributed FDB and LDB is ensured by the AxWin Access Control Software developed by Apice.

The Lon Server manages the Users and Badge archives, the Access Level information, the historical transit data retention and anomalous transit conditions in a completely transparent way for the user.

The LonServer also manages the messages displayed on the JLON identification units.

From the hardware point of view, the node exploits the Neuron Chip for communication purposes only (implements layer 1-6 of the ISO/OSI standard), while all the application is handled by an external 32 bits microcontroller (layer 7). A dedicated operating system called LOS (Lonserver Operating System) has been developed for the node and can be updated through RS232 port or directly from the LonWorks® network, using the AxWin software.

This feature makes the LonServer suitable to be adapted for handling many different applications in the Building Automation and Industrial Control fields.

Other application-specific operating systems have been developed and customized on demand to meet the requirements of the customer's application.
The node is used in customized versions in the Apice LONWORKS® Parking System, in the Central Alarm unit and in the Technological Alarms Monitoring unit for industrial environment.

In several applications the Lon Server can be used as Data & Event Logger, storing information in its FDB generated by other devices in the network fed into an external-log input variable.

All the commercial versions include an RS232 port for application software upgrading, 128 or 512 kbytes on-board RAM memory with backup lithium battery and real time clock embedded.

The internal power supply is obtained through an isolated DC/DC converter, where the incoming voltage can range from 10 to 35 VDC/ 12 to 24VAC. This feature makes the product suitable for working in almost any condition in the Building Automation and Industrial Controls fields.

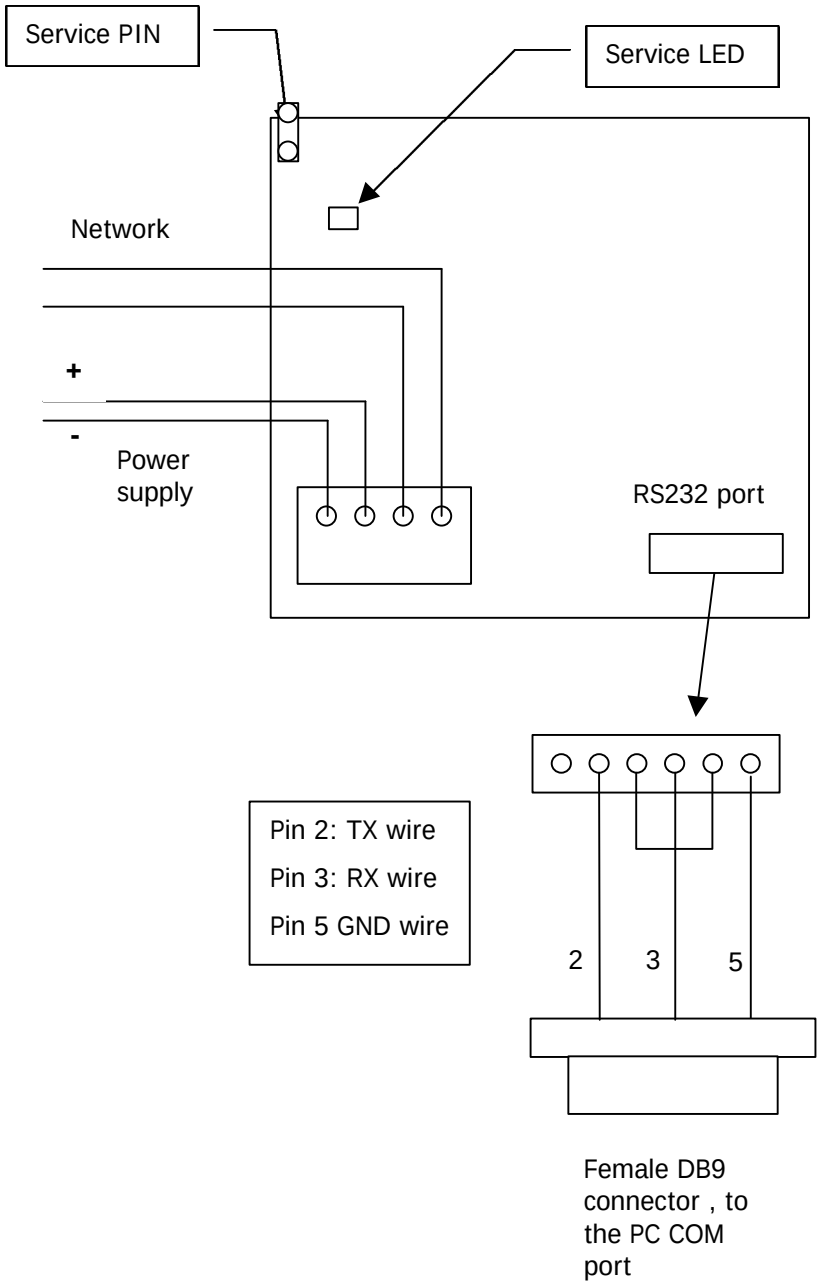
Technical Specifications

Power supply	10 – 35 VDC/ 12 to 24VAC internal isolated DC/DC converter
Power consumption	70 mA @ 12V
Transceiver	LONWORKS® FTT-10 78 Kb/s
Communication Processor	Neuron Chip 3150
Clock frequency	10 MHz
Host Processor	32 bits Microcontroller
Real Time Clock	Chip on-board
RAM Memory	128 or 512 Kbytes on board – backup lithium battery
Service Interface	Service pin or manual entry – service led on-board
Operating Temp.	0 – 50° C
Relative Humidity	20 – 80% non-condensing
Enclosure type	Plastic blend autoextinguishing
Enclosure mounting	Wall mounted or panel mount
Mechanical Dimensions	150 x 90 x 45 mm
Application Program	LSRVM03
Program ID	90:0A:0E:00:01:00:10:03
XIF file	lsrvm03.xif
NV count	358
Alias count	0
Certification	CE

Installation guidelines

The LonServer needs only to be wired on the power supply and provided with a LONWORKS® network connection.

The following picture shows the rear view of the LonServer board, where the power supply and the network cables are to be connected.



Regarding the power supply connection, please design the power supply line in a way to assure that the node is always powered within the specified operating range.

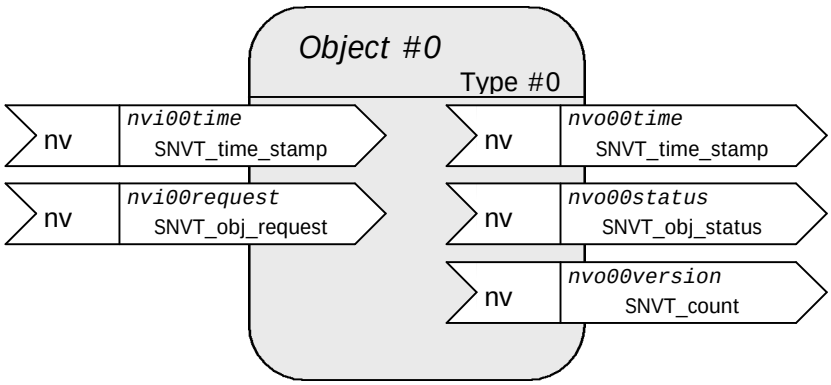
The node is sensitive to the power supply polarity, so it cannot work properly if the supply line is swapped. Anyway, the node is protected against this mis-wiring condition and it does not break down. Neverthless, no guarantee of integrity is provided if the power supply value rings out the spec range or remains mis-wired for a long period of time.

As far as the LONWORKS® network connections are concerned, the LonServer node must be wired following the guidelines reported into “Junction Box and Wiring Guidelines for twisted pair LONWORKS® networks” Engineering Bullettin, June 1999.

Service Interface

The LonServer node mounts both the service LED and the service PIN button on board, for easy installation. This circuitry is not accesible by the outside of the enclosure.
Please, make sure the node is installed and commissioned properly before re-mounting the cover and leaving the hardware in its final position.

Objects #0 type: node object



nvi00time type **SNVT_time_stamp**
This variable set the leggo 2000 RTC.

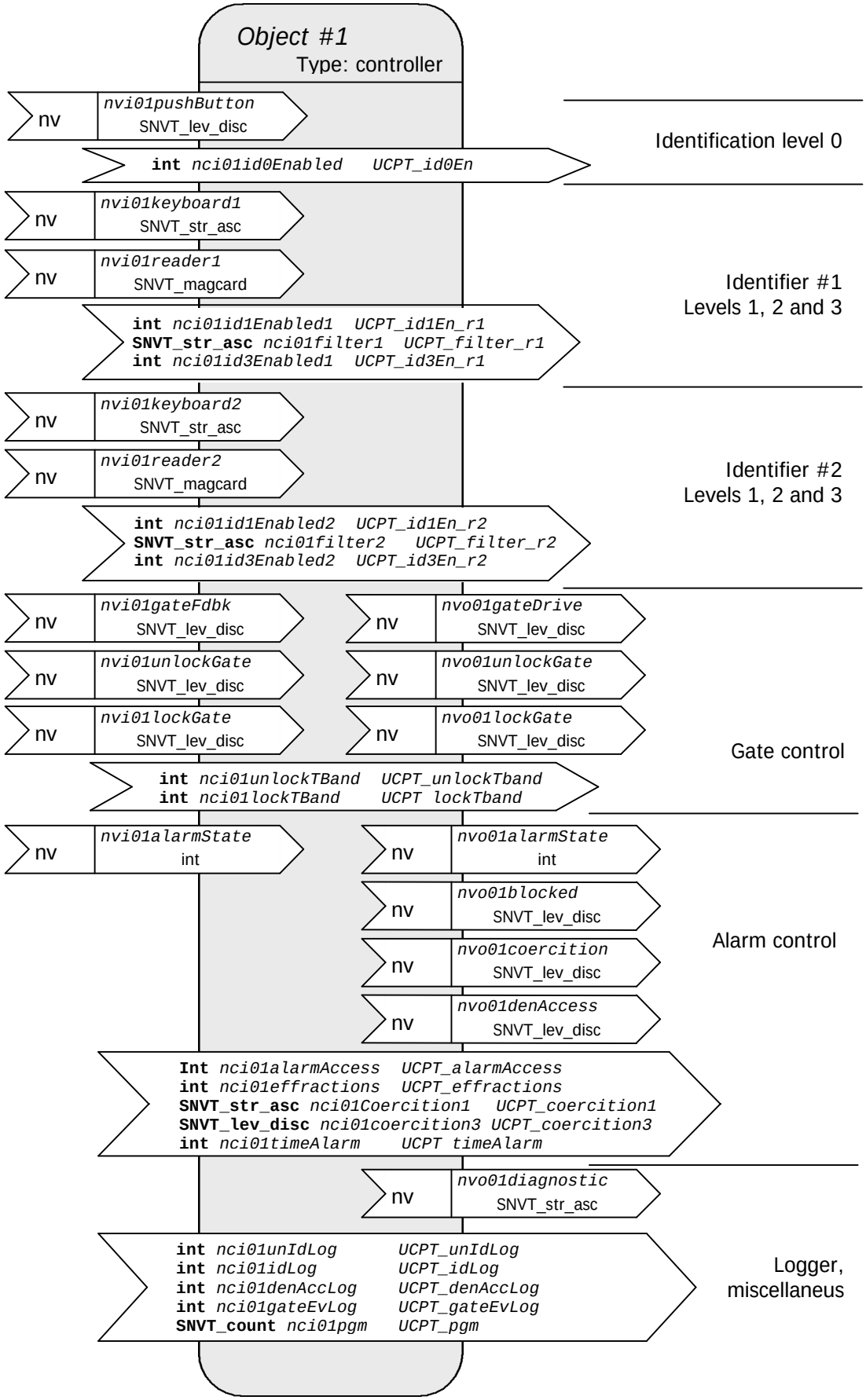
nvo00time type **SNVT_time_stamp**
This variable read out the leggo 2000 RTC. It is updated each second.

nvi00request type **SNVT_obj_request**
This LonMark request variable.

nvo00status type **SNVT_obj_status**
The LonMark status variable.

nv00version type **SNVT_count**
This is a const polled network variables. Its value is the firmware version, actually 10 = 10.

Objects #1..8 type: Access Controller



The access controller object is extremely powerful. The LonServer has 8 different access controllers, each one able of handling one access point. An access point is a gate, a door, a barrier or any other device which needs to be activated through an identification process.
The identification process can have 4 different levels:

Level 0 means no identification, like a command coming from a push button or a presence detector.
Level 1 means the PIN code recognition
Level 2 means card recognition
Level 3 means card + PIN code recognition

Identification levels can be set separately for each access point. They can also be switched automatically from one to the other during the day and the week, and also depending from the alarm state. I.e. each identification level can be always disabled, enabled only in a certain time band or always enabled. The identification level can also be disabled when the alarm is active.

Each access point can be driven by one or more pushbuttons and two identifiers. Each identifier is composed of one reader and one keyboard.

An interaction with the alarm state is performed when the access is done when the alarm is active. In this case, the alarm status moves into pre-alarm or turn-off conditions.

The coercition access can be detected using identification levels 1 and 3.

In certain time band, the gate can switch to locked or unlocked state.

An accurate event log is performed by object.

Three door alarms can be detected using the gate controller built inside the IOL222 node and the access can be logged with the gate result status.

When the user inserts the PIN code and makes a number of mistakes greater than the maximum allowed, and effraction is generated and the identifier (reader + keyboard) goes into the blocked status for 3 minutes. This blocked status is read out by a network variable too.

An accurate diagnostic network variable allows to simplify installation and start-up operations when the server is not accessible.

Network variables description:

Identification level 0:

nvi01pushButton type **SNVT_lev_disc**

This variable is driven by any LonMark sensor to enable the gate opening. This operation does not identify the user but however can be saved to the event memory (see *nci01unIdLog*).

UCPT_id0En (or nci01id0Enabled) type **int** default = 255

This variable describes the identification level 0 mode:

UCPT_id0En	**Description**
0	The pushbutton opening is not enabled
1..64	The pushbutton opening is enabled in time band 1..64
65..254	Values not allowed
255	The pushbutton opening is always enabled

Identifier #1 (identification level 1, 2 and 3)

nvi01keyboard1 type **SNVT_str_asc**

This variable receives data from an APICE keyboard object, like the one embedded into the JLON device. The server answers through explicit messages, to avoid binding and address table consumption. The keyboard bound to this variable works normally as outdoor keyboard. (outside the protected side of the gate).

nvi01reader1 type **SNVT_magcard**

This variable receive datas from an APICE reader object, like the one embedded into the IOL222 or JLON devices. The server answers through explicit messages, to avoid binding and address table consumption. The keyboard bound to this variable works normally as the outdoor reader (outside the protected side of the gate).

UCPT_id1En_r1 (or nci01id1Enabled1) type **int** default = 255

PIN operation (identification level 1).

UCPT_id1En_r1	**Description**
0	The sole pin operation is not allowed
1..64	The sole pin operation is allowed in time band 1..64
65..253	Value not allowed
254	Only the usage of justification is allowed
255	The sole pin operation is always allowed

UCPT_filter_r1 (or nci01filter1)
type **SNVT_str_asc** default = "PPPPCCCC"

This variable configures how the magcard string is split. Use a 'P' character to indicate a fix code (prefix) field character, and a 'C' character to indicate a card code field character; the character '0' stands for don't care.

Example:

The magcard has the following record trak:
0010005402356
where:
001 = don't care (characters to skip)
00054 = card code
02356 = fixed code

the filter value must be:
000CCCCCPPPPP

If a PX10 reader is used as proximity card reader, you can simply set the filter to **X**: in this case all 40 bits read out from the proximity card are used to identify the badge.

UCPT_id3En_r1 (or nci01id3Enabled1) type **int** default = 0

Card + PIN operation (identification level 3).

UCPT_id3En_r1	**Description**
0	The PIN code is never required
1..64	The PIN code is required in time band 1..64
65..254	Value not allowed
255	The PIN code is always required

Identifier #2 (identification level 1, 2 and 3)

nvi01keyboard2 type **SNVT_str_asc**

This variable receives data from an APICE keyboard object, like the one embedded into the JLON device. The server answers through explicit messages, to avoid binding and address table consumption. The keyboard bound to this variable works normally as indoor keyboard. (inside the protected side of the gate).

nvi01reader2 type **SNVT_magcard**

This variable receive datas from an APICE reader object, like the one embedded into the IOL222 or JLON devices. The server answers through explicit messages, to avoid binding and address table consumption. The keyboard bound to this variable works normally as the indoor reader (inside the protected side of the gate).

UCPT_id1En_r2 (or nci01id1Enabled2) type **int** default = 255

PIN operation (identification level 2).

UCPT_id1En_r2	**Description**
0	The sole pin operation is not allowed
1..64	The sole pin operation is allowed in time band 1..64
65..253	Value not allowed
254	Only the usage of justification is allowed
255	The sole pin operation is always allowed

UCPT_filter_r2 (or nci01filter2)
type **SNVT_str_asc** default = "PPPPCCCC"

This variable configures how the magcard string is split. Use a 'P' character to indicate a fix code (prefix) field character, and a 'C' character to indicate a card code field character; the character '0' stands for don't care.

Example:

The magcard has the following record trak:
0010005402356
where:
001 = don't match (characters to skip)
00054 = card code
02356 = fix code

the filter value must be:
000CCCCCPPPPP

If a PX10 reader is used as proximity card reader, you can simply set the filter to **X**: in this case all 40 bits read out from the proximity card are used to identify the badge.

UCPT_id3En_r2 (or nci01id3Enabled2) type **int** default = 0

Card + PIN operation (identification level 3).

UCPT_id3En_r2	**Description**
0	The PIN code is never required
1..64	The PIN code is required in time band 1..64
65..254	Not allowed
255	The PIN code is always required

Gate controller

nvo01gatedrive type **SNVT_lev_disc**

This variable drives the normal opening of the remote gate controller. The output goes to ST_ON and return to ST_OFF value after a while. The gate controller is activated by the rising edge of this variable (update to ST_ON).

nvo01unlockGate type **SNVT_lev_disc**

This variable goes to ST_ON when the unlock time band is active or *nvi01lockGate* goes to ST_ON. The unlock state skip the gate feedback information, saving immediately in the event memory the access request coming from the keyboard or the reader as 'Transit done'. The door alarms are ingnored, and are not saved if the gate is unlocked. This variable can also be bound to the remote IOL222 gate controller unlock input variable.

nvi01unlockGate type **SNVT_lev_disc**

Put the gate unlocked.

nvo01lockGate type **SNVT_lev_disc**

This variable goes to ST_ON value when the lock time band is active or *nvi01unlockGate* goes to ST_ON. The lock state does not allow access from pushbutton, keyboard and reader. This variable can also be bound to the IOL222 gate controller lock input variable. When this variable is ST_ON, the *nvo01unlockGate* is automatically set to ST_OFF.

nvi01lockGate type **SNVT_lev_disc**

Put the gate lock.

nvi01gateFdbk type **SNVT_lev_disc**

This variable receives the feedback from the IOL222 gate controller. Although the type is SNVT_lev_disc, the meaning of each value is the following:

Value (int)	**Value (SNVT_lev_disc)**	***Description***
0	ST_OFF	End access
1	ST_LOW	Begin access
2	ST_MED	Open door
3	ST_HIGH	Intruder state
4	ST_ON	Door left open
5	NA	Not transit done

The IOL222 gate controller object provides the rigth feedback. The door feedback is used to store the access and door state together and store gate anomalies. To use the feedback, the variable *nci01needFdbk* must be set to **1**.

UCPT_unlockTband (or nci01unlockTBand) type **int** default = 0

A value beetween 1 and 64 is the time band number to unlock gate. When this time band is active, the gate is in unlock state. The value 0 means not used.

UCPT_lockTband (or nci01lockTBand) type **int** default = 0

A value beetween 1 and 64 is the time band number to the lock gate. When this time band is active, the gate is in lock state. The value 0 means not used.

Alarm controller

nvi01alarmState type **SNVT_lev_disc**

This variable drives the alarm state of the object. Every time the value changes, it is always logged and propagated in *nvo01alarmState*.

nvi01alarmState	**Alarm state**
ST_OFF	Off
ST_LOW	During the turning-on time
ST_MED	During the pre-alarm time
ST_HIGH	In alarm
ST_ON	On

nvo01alarmState type **SNVT_lev_disc**

This variable is modified either by *nvi01alarmState* changes or by an access occurring when the alarm is turned-on. In the second case, but not with manual open operation, the event and user identification are logged together.

nvo01blocked type **SNVT_lev_disc**

This variable is ST_ON during the security block time and ST_OF during normal operation. See *nci01effractions* for more information.

nvo01coercition type **SNVT_lev_disc**

This variable goes to ST_ON when a coercition event is detected. It remains in this state for *nci01timeAlarm* , then returns to ST_OFF.

nvo01denAccess type **SNVT_lev_disc**

This variable goes to ST_ON if the LonServer detects a number of errors greater than the maximum allowed. It remains in this state for *nci01timeAlarm*, then return to ST_OFF.

UCPT_effractions (or nci01effractions) type **int** default = 0

When an identifier detects some consecutive access denied operations, it can generate an alarm and/or block itself for 3 minutes. For the PIN code operation, 3 consecutive errors are normally allowed for the first code entrance operation before an error is counted. After the first three mistakes, each mistake is counted as one additional error.

bit	7	6	5	4	3	2	1	0
field	A3	A2	*A1*	A0	B3	*B2*	*B1*	*B0*

Max # of mistakes to generate alarm (0= do not generate).

Max # of mistakes to generate block.

UCPT_coercition1 (or nci01coercition1)
type **SNVT_str_asc** default = “”

This variable contains a coercition code for identification level 1. If the first character is 0 (empty string), the object has not a coercition code for sole PIN operation.

UCPT_coercition3 (or nci01coercition3)
type **SNVT_lev_disc** default = ST_OFF

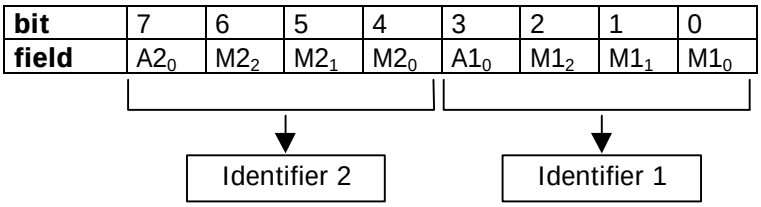
When the card+PIN code operation is enabled, this variable allows to distinguish a coercition event when the user digits a PIN+1 code on the keyboard. This requires that the variable is programmed to ST_ON.

UCPT_timeAlarm (or nci01timeAlarm) type **int** default = 5

This variable is used to set the *nvo01coercition* and *nvo01accErr* alarm time (in seconds).

UCPT_alarmAccess (or nci01alarmAccess) type **int** default = ?

This variable change the access mode for each identifier when alarm is on.



MX_2	MX_1	MX_0	Description
0	0	0	Access denied
0	0	1	Always allowed normally
0	1	0	Allowed with PIN, card and card + PIN
0	1	1	Allowed with card or card + PIN
1	0	0	Allowed with card + PIN only
1	0	1	Access denied
1	1	0	Access denied
1	1	1	Access denied

AX_0	Description
0	After access send alarm in pre-alarm state.
1	After access turn off alarm.

Notes: When the alarm is turned on and a pushbutton opening request is received, the alarm rigths for this device are the same as those of identifier 1. Access is allowed to different identification level even if they are normally enabled. If one identificatoion level is normally disabled, when alarm is turned on it continues to be disabled.

Logger

UCPT_unIdLog (or nci01unIdLog) type **int** default = 0

Unidentified event logger (pushbutton open)

UCPT_unIdLog	Description
0	The pushbutton opening is not saved
1..64	The pushbutton opening is saved in time band 1..64
65..254	Value not allowed
255	The pushbutton opening is always saved

UCPT_idLog (or nci01idLog) type **int** default = 255

Identified event logger. In this version, log of identified access is always enabled and this variable is not used.

UCPT_denAccLog (or nci01denAccLog) type **int** default = 255

Access denied logger.

UCPT_denAccLog	Description
0	The access denied are not saved.
1..64	The access denied saved in time band 1..64.
65..254	Value not allowed.
255	The access denied are always saved.

UCPT_gateEvLog (or nci01gateEvLog) type **int** default = 1

Gate event logger.

UCPT_gateEvLog	Description
0	The gate states are not saved.
1..64	The gate states are saved in time band 1..64.
65..254	Value not allowed.
255	The gate states are always saved.

When the gate states are saved, an identified event is saved only when gate complete the transaction or when it goes in alarm conditions. Other unidentified gate states are saved as well. When the gate states are not saved, an identified access is saved immediatly after the badge is passed, without waiting for the transaction to complete or alarms to come up.

Diagnostic

nvo01Diagnostic type **SNVT_str_asc**

This variable provides useful information during the installation and start-up phases. In fact, when an operation fails, the reason is shown in this variable. The meaning of diagnostic messages is the following:

Message	Means
#01 Pushbutton disabled	When a pushbutton operation is done but the *nci01enable* is set to 0 or to an unactive time band number.
#02 Pushb. Disabled w/t alarm	When a pushbutton operation is done with the alarm turned-on and *nci01alarmDsbl* set to ST_ON.
#03 Object blocked	When a PIN or a card read operation is done while the identifier is blocked. The pushbutton operation is not affected by the blocked state.
#04 Sole PIN disabled	When a sole PIN operation is done but the *nci01pinEnabledX* variable is set to 0 or to an unactive time band number.
#05 PIN disabled w/t alarm	A sole PIN operation is attempted when the alarm is turned-on and the *nci01disablePinX* variable is set to ST_ON value.
#06 PIN aborted	Not used in this version
#07 Wrong PIN detected	This error occurs in the first 3 PIN code mistakes. Later the #14.03 message is read out.
#08 Coercition detected	When a coercition access is detected
#09 Access authorized	When an allowed access is detected from a keyboard or a card read operation.
#10 Pin operation pending	When a card read operation is detected but the keyboard is busy in a PIN digit operation.
#11 Card filter does not match	When a card is read but the record track does not match the filter settings in *nci01filterX* variable.
#12 Reader disabled w/t alar	When a card read operation is detected with the alarm turned on but either the reader is disabled (*nci01alarmAccX* = 0) or the user has not the rigths to turn-off the alarm. The same condition for the keyboard object reads out the #14.04 message.
#13 PIN code request	The card read operation required PIN code.
#14 Access denied	This message is not read out in this version. This version uses the #14.XX messages with more details.
#15 Gate locked	When a pushbutton either a PIN or a card read operations is done when the gate is locked.
#14.01 Card unknown	The record track matches the filter but not the fixed code field. Set one of the *nci09prefX* variable to a match fixed code.
#14.02 Code unknown	The filter and the fixed code match together but the card code is not in memory. Store the card in memory to have access.
#14.03 Wrong PIN	This message is read out after a wrong PIN operation after the first 3 mistakes.
#14.04 No rigth	This messages is read out in sole PIN operation with alarm inserted, when the user has not the rigths to turn the alarm off.
#14.05 Reader error	Not used in this version
#14.06 APB error	This message is read out when the user data are stored in the memory but the user is not enabled in this identifier (maybe it is in other identifiers)
#14.07 Time band	This message is read out when the user time band access for this identifier is turned off.
#14.08 Expired	This message is read out when the user's badge is expired. (1)
#14.09 No credit	This message is read out when the user has not an enough credits to complete the current operation. (1)
#14.10 Database error	This message is read out if an internal database error is detected.

(1) The current version does not handle the expiration time band and the credit. This messages will be used in future releases.

Object working mode

UCPT_pgm (or nci01pgm) type **SNVT_str_asc** default = 0

This variable is used to change internal object working mode. This firmware version does not handle this value, but the variable is implemented for future use.

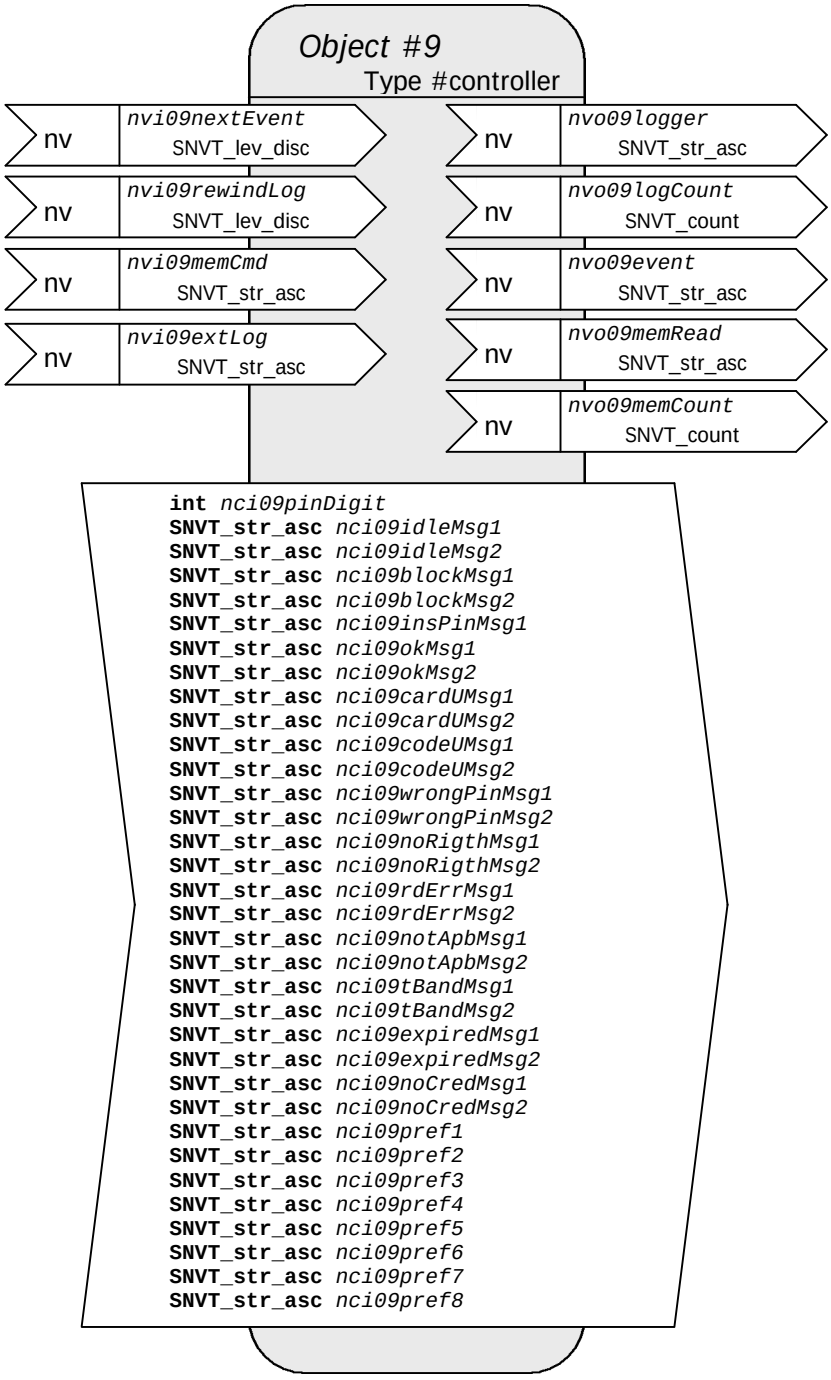
NOTE:
If a keyboard bound is removed or is changed with another keyboard object having different subnet/node address, you must write, using a maintenance tool, the string CLEAR in *nviXXkeyboardX* network variable to reset the internal address memory buffer.

If the local readers and keyboard are used, you need to bind *nvo15keyboard* output network variable to *nviXXkeyboard1* input network variable. In general the local reader (*nvo13reader* or *nvo14reader*) bound with the *nviXXreader2* network variable uses the keyboard bound in *nviXXkeyboard1* network variable.

It is possible to distinguish the card sweeping direction in the local reader using *nci11pgm* configuration network variable. For more details see object 13 and 14.

When *nvi01alarmState* is ST_LOW, it is always possible to turn off the alarm without turning off rigths too. When *nvi01alarmState* has a value greater than ST_LOW, the user's turn-off rigths are required and the object must be programmed to allow access with alarm state turned on.

Object #9 type: common params access controller



Object 9 contains the network variables to handle the memory information concerning the list of enabled cards, the user types and the logger. This object also stores in several configuration network variables the common access control information, like the user messages, the fixed code, etc.

LOGGER:

nvo09logger type **SNVT_str_asc**

This variable reads out, one record at a time, the log file information. The current record is read out until *nvi09nextEvent* is updated to ST_ON value. The current record is not the last event happened but the last event read out. When the log file is completely read out, the string EMPTY is sent.
The meaning of the various fields is the following:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
dd	*mm*	*ce*	*Yy*	*hh*	*nn*	*ss*	*snd*	*n*	*ev*	*cH*	*cL*	*cL*	*cL*	*cL*	*arg*	*arg*	*arg*	*arg*

The top row shows the ascii elements of the network variable, the bottom row the field means.

dd Day (1..31)
mm Month (1..12)
ce Century (19, 20...)
yy Year (99, 00, ...)
nn Minute (00..59)
ss Seconds (00.59)
snd Sender (See table below)
n Sender number (See table below)
ev Event kynd(See table below)
cH Code High (Used for proximity cards)
cL Code Low Card code in long format. ascii[11] is the MSB, ascii[14] is the LSB.
arg Argument Argument in long format. ascii[15] is the MSB, ascii[18] is the LSB.

Senders table:

Sender #	**Sender**
1	Pushbutton controller
2	Keyboard
3	Reader
4	Gate
5	Alarm point
6	Memory

Sender number:
The sender number is related to the access controller object, as shown in the table:

Device/OBJ	**OBJ1**	**OBJ2**	**OBJ3**	**OBJ4**	**OBJ5**	**OBJ6**	**OBJ7**	**OBJ8**
Pushbutton	1	2	3	4	5	6	7	8
Keyboard1	1	3	5	7	9	11	13	15
Reader 1	1	3	5	7	9	11	13	15
Keyboard 2	2	4	6	8	10	12	14	16
Reader 2	2	4	6	8	10	12	14	16
Gate	1	2	3	4	5	6	7	8
Memory	0	0	0	0	0	0	0	0

Event code:
The following table shows the event codes. The **Cd** column, if remarked, means that the event contains the card code identifier. The **arg** column, if remarked, means that the field can contain an argument field. The **X** marks mean that the field is optional, while the **O** marks that is mandatory. The mnemonic column shows the mnemonic event code for the *nvo09event* variable.

#	Description	Cd	Arg	Mnemonic
0	No event			NONE
1	Transit done	X	X	PASS
2	Transit not done	X	X	NO PASS
3	Door left open	X	X	LEFTOPEN
4	Coercition	O		COERCIT
5	Intruder door alarm			INTRUDER
6	Access denied. Argument shows the cause of refusing	X	O	See table below
7	Security block of identifier activated	X		BLOCKED
8	Security block end			UNBLOCKED
9	Gate goes in lock state			LOCK ON
10	Gate return from the lock state			LOCK OFF
11	Gate goes in unlock state			UNLK ON
12	Gate return from the lock state			UNLK OFF
13	Pushbutton enable time band goes active			MANU ON
14	Pushbutton enable time band goes not active			MANU OFF
15	Sole PIN enable time band goes active			PIN ON
16	Sole PIN enable time band goes not active			PIN OFF
17	Card + PIN request time band goes active			PINRQ ON
18	Card + PIN request time band goes not active			PINRQ OF
19	Alarm goes into pre-alarm state	X		PREALARM
20	Alarm is turned off	X		ALRM OFF
21	Alarm is turned on	X		ALRM ON
22	Alarm goes in alarm state (obsolete)			ALARM
23	Alarm is being inserted (exit time)	X		INSERT
24	A new card is stored	O	O	STORED
25	A card in memory has been modified	O	O	EDIT
26	A card in memory has been deleted	O		DELETED
27	All card memory has been deleted			DEL CARD
28	All log event has been deleted			DEL LOG
29	The devices has been overriden with default values			DEF VAL
30	Gate close			GATECLS
31	Alarm triggered (Alarm condition detected)			
32	Alarm restored (restore normal operation)			

Code field:

The code field contains the codeHi and CodeLow when identified people cause the event. For the card memory sender, the code field contains the modified code.

Arg field:

The transit event can contain an argument, such as justify or debit values (not enable in this version). The access denied event contains the reason of refusing, while the memory event contains the enable capability of the card as 16 bit Hex number, where LSB is the enable flag for identifier 1 and the MSB for the identifier #16.

Access denied refusing code:
The meaning of each code is shown in the following table:

Code	Description	Mnemonic
0	Coercition	COERCIT
1	Not applicable	NONE
2	Card does not match the fixed code	CARD UNK
3	Card code not stored in memory	CODE UNK
4	Wrong pin	WRONGPIN
5	No rigths to turn-off the alarm	NO RIGTH
6	Not applicable	NO ERR M
7	Not applicable	NO ERR M
8	Card is in memory but is not enabled in this identifier	NOT APB
9	Access time band is not active	TM BAND
10	Card is expired	EXPIRED
11	Credit is not enougth	CREDIT
12	Database internal error	DBERROR

nvi09nextEvent type **SNVT_lev_disc**
When this variable is updated to ST_ON, the next event is sent to the *nvo09logger* variable.

nvi09rewindEvent type **SNVT_lev_disc**
When this variable is updated to ST_ON, the log is rewound to the oldest event which sent to the *nvo09logger* variable.

nvo09event type **SNVT_str_asc**
This variable is useful in debug session or in start-up operation. This variable is updated with the last event logged and it show the event in the followed format:

Sxx-event-codeLow-Arg

Where:

S Sender identifier (1 character):
N = none
M = Pushbutton (manual open)
K = Keyboard
R = Reader
G = Gate
A = Alarm point
E = Memory
xx Sender number, 2 characters formatted whith left zero filler.
- Separator
event Mnemonic, 8 characters with left space filler.
- Separator
codeLow Code low, 8 characters whith left zero filler.
- Separator
Arg Argument, 8 character, hexadecimal notation with left zero filler.

For details about the sender number and mnemonic, see tables of nvo09logger description above.

nvo09logCount type **SNVT_count**
This variable shows the event numer to be read out from the *nvo09logger* network variable.

nvi09extLog type **SNVT_str_asc**

This variable receives external events to be saved in the logger. The used fields are:

ascii[0] = sender type
ascii[1] = sender number
ascii[2] = event

Other fields will be used in future releases.

CARD MEMORY:

nvo09memCount type **SNVT_count**

This variable shows the number of the cards stored in memory.

nvi09memCmd type **SNVT_str_asc**

This variable allows to send command to the memory.

nvo09memRead type **SNVT_str_asc**

This variable is used to show the command result.

Add a card in memory:

ascii	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
field	A	*T*	*H*	*E*	*E*	*L*	*L*	*L*	*L*	*P*	*P*	*P*	*P*	*T*	*T*

A = Character A
T = Type (1..16)
H = Code high (0..255)
EE = Enable flag (16 bits, one for each identifier, see below)
LLLL = Code low, 4 bytes long. ascii[5] = MSB, ascii[8] = LSB.
PPPP = PIN code, 4 bytes long. ascii[9] = MSB, ascii[12] = LSB.
TT = Tag, 2 bytes long. ascii[13] = MSB, ascii[14] = LSB.

Enable flag details:

ascii[3]								ascii[4]							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

The top row shows the ascii[] element in the network variable, while the middle row shows the bit number, where bit 7 is the MSB. The lower row is the related identifier number. If the bit is set to 1 the card is enabled in the identifier, otherwise if the bit is set to 0, the card is not enable in the identifier.

Results:

The *nvo09memRead* variable shows the results:

OK: STORED	If the card is stored in memory
ER: PIN EXSIST	If the card is not stored because the PIN code already exsists.
ER: MEMORY FULL	If the memory buffer is full

Update card in memory:

This command is similar to the previous one but in this case the sent enable flag are or(ed) with the enable flag stored in memory. To distinguish with the previous command, the update card start with the character **U**.

ascii	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
field	U	*T*	*H*	*E*	*E*	*L*	*L*	*L*	*L*	*P*	*P*	*P*	*P*	*T*	*T*

Results:

This command has the same results of the previous command.

Check card in memory:

This command is used to test if a card is stored in memory.

ascii	0	1	2	3	4	5	6	7	8
field	C	-	*H*	-	-	*L*	*L*	*L*	*L*

Results:

ER: NOT IN MEMORY If the card is not found in memory.
If the card is found, the result will be OK followed by all the card info, as shown below:

ascii	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
field	O	K	:		*T*	*H*	*E*	*E*	*L*	*L*	*L*	*L*	*P*	*P*	*P*	*P*	*T*	*T*

Remove a card from memory:

This command is used to remove a card from the memory.

ascii	0	1	2	3	4	5	6	7	8
field	D	-	*H*	-	-	*L*	*L*	*L*	*L*

Results:

OK: DELETED Even if the card is not found in memory.

Read card memory at *n* position:

ascii	0	1	2	3	...	...
field	R	x	x	x	...	'\0'

The xxx.. is an ASCII string, zero ending, showing the position to be read.

Results:

ER: NOT IN MEMORY If the position is greater then the number of cards stored in memory.
If the card is found, the message is OK followed by all the card info, as shown below:

ascii	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
field	O	K	:		*T*	*H*	*E*	*E*	*L*	*L*	*L*	*L*	*P*	*P*	*P*	*P*	*T*	*T*

USER TYPE MEMORY:

The user type memory is handled through the *nvi09memCmd* and *nvo09memRead* network variables too. The command provided to handle this memory is the F command, as shown below:

Write a user type:

This command changes the access time band and the alarm rigths of an user type into an identifier.

ascii	0	1	2	3	4	5	6	7	8	9	10	11
field	F	*u*	*u*	.	*i*	*i*	,	*f*	*f*	,	*a*	\0

Where:

F Command character
uu User type, using two characters with left zero filled (1..16).
. Separator
ii Identifier number, using two characters with left zero filled (1..16).
, Separator
ff User *uu*, identifier *ii* access time band (0..32)
a Alarm rigth (0..3):
0 = NONE
1 = ONLY INSERT
2 = INSERT AND UNINSERT
3 = ALL
\0 Null terminator

Results:

ER: WRONG FORMAT if the ascii[3] or ascii[9] or ascii[11] don't matches.
ER: WRONG ARGUMENTS if the arguments are out of range
Or if the command is executed:

ascii	0	1	2	3	4	5	6	7	8	9	10	11
field	F	*u*	*u*	.	*i*	*i*	,	*f*	*f*	,	*a*	\0

Delete an user type:

This command restores the no access time band and the no alarm rigths for an user into an identifier.

ascii	0	1	2	3	4	5	6
field	F	*u*	*u*	.	*i*	*i*	D

In delete command, 0 values are allowed in uu and ii fields. 0 value means all like in examples:

F01.01D delete the user type 1 in identifier 1
F01.00D delete the user type 1 in all identifiers
F00.01D delete all user types in identifier 1
F00.00D delete all user types in all identifiers

Results:

ER: WRONG FORMAT if ascii[3] does not match.
OK: TYPE *uu* DEL KEYB *ii*
OK: TYPE *uu* DEL ALL KEYB
OK: KEYB *ii* DEL ALL TYPES
OK: DEL ALL TYPES ALL KEYB

Read user type:

To read an user type use the following command:

ascii	0	1	2	3	4	5	6
field	F	*u*	*u*	.	*i*	*i*	?

Results:

ER: WRONG FORMAT if ascii[3] doesn't match.
ER: WRONG ARGUMENTS if arguments are out of range
Or if the command is executed:

ascii	0	1	2	3	4	5	6	7	8	9	10	11
field	F	*u*	*u*	.	*i*	*i*	,	*f*	*f*	,	*a*	\0

PASSWORD PROTECTED OPERATIONS:

Using nvi09memCmd is possible to erase all the card memory, all the event memory and to restore the LonServer to the default values (factory defaults). To do this, the password is required. The default value is **123456**.

Delete card memory:

ascii	0	1	2	3	4	5	6	7
field	M	C	*x*	*x*	*x*	*x*	*x*	*x*

xxxxxx = password (6 characters)

Results:

ER: WRONG PASSWORD if the password is not correct
OK: CLEAR CARD MEMORY if the password is fine

Delete event memory:

ascii	0	1	2	3	4	5	6	7
field	M	E	*x*	*x*	*x*	*x*	*x*	*x*

xxxxxx = password (6 characters)

Results:

ER: WRONG PASSWORD if the password is not correct
OK: CLEAR LOG MEMORY if the password is fine

Restore default:

ascii	0	1	2	3	4	5	6	7
field	M	A	*x*	*x*	*x*	*x*	*x*	*x*

xxxxxx = password (6 characters)

Results:

ER: WRONG PASSWORD if the password is not correct
OK: DEFAULT RESTORED if the password is fine

Change password:

ascii	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
field	M	P	*x*	*x*	*x*	*x*	*x*	*x*	,	*n*	*n*	*n*	*n*	*n*	*n*

xxxxxx = password (6 characters)
nnnnnn = new password (6 characters)

Results:

ER: WRONG PASSWORD if the password is not correct
OK: PASSWORD CHANGED if the password is fine

CONFIGURATION NETWORK VARIABLES

UCPT_pinDigits (or nci09pinDigit) type **int** default = 5
The digit number of PIN (3..9)

UCPT_idleMsg1 (or nci09idleMsg1)
type **SNVT_str_asc** default = "#D#PASSARE TESSERA"
UCPT_idleMsg2 (or nci09idleMsg2)
type **SNVT_str_asc** default = "<- <- <- <- <-"
Idle message row 1 and 2. The #D# means print date and time in the first row of the local display. If the local keyboard is used, the idle message in local display will be date and time in the first row and the rest of string in *nci09idleMsg1* the second row. JLON ignore the #D# command.

UCPT_blockMsg1 (or nci09blockMsg1)
type **SNVT_str_asc** default = "   EFFRAZIONE"
UCPT_blockMsg2 (or nci09blockMsg2)
type **SNVT_str_asc** default = "ATTENDERE PREGO"
Identifier blocked message, row 1 and 2.

UCPT_insPinMsg1 (or nci09insPinMsg1)
type **SNVT_str_asc** default = "INSERIRE CODICE"
Insert PIN request, only row 1.

UCPT_okMsg1 (or nci09okMsg1)
type **SNVT_str_asc** default = "ENTRARE   PREGO"
UCPT_okMsg2 (or nci09okMsg2)
type **SNVT_str_asc** default = ""
Access allowed message, row 1 and 2.

UCPT_cardUMsg1 (or nci09cardUMsg1)
type **SNVT_str_asc** default = "CODICE O CARTA"
UCPT_cardUMsg2 (or nci09cardUMsg2)
type **SNVT_str_asc** default = " SCONOSCIUTI"

Access denied for unknow card, row 1 and 2.

UCPT_codeUMsg1 (or nci09codeUMsg1)
type **SNVT_str_asc** default = " UTENTE NON"
UCPT_codeUMsg2 (or nci09codeUMsg2)
type **SNVT_str_asc** default = " ABILITATO"
Access denied for code unknown, row 1 and 2.

UCPT_wrongPinMsg1 (or nci09wrongPinMsg1)
type **SNVT_str_asc** default = "CODICE PIN"
UCPT_wrongPinMsg2 (or nci09wrongPinMsg2)
type **SNVT_str_asc** default = "ERRATO"
Wrong PIN message, row 1 and 2.

UCPT_noRightMsg1 (or nci09noRigthMsg1)
type **SNVT_str_asc** default = "ACCESSO NEGATO"
UCPT_noRightMsg2 (or nci09noRigthMsg2)
type **SNVT_str_asc** default = "ALLARME INSERITO"
No enougth rigth to access with alarm on, row 1 and 2.

UCPT_rdErrMsg1 (or nci09rdErrMsg1)
type **SNVT_str_asc** default = "ERRORE LETTURA"
UCPT_rdErrMsg2 (or nci09rdErrMsg2)
type **SNVT_str_asc** default = "PROVARE DI NUOVO"
Card doesn't match the filter message, row 1 and 2.

UCPT_notApbMsg1 (or nci09notApbMsg1)
type **SNVT_str_asc** default = "PERCORSO"
UCPT_notApbMsg2 (or nci09notApbMsg2)
type **SNVT_str_asc** default = "NON CORRETTO"
Card enabled but not in this identifier message, row 1 and 2.

UCPT_tBandMsg1 (or nci09tBandMsg1)
type **SNVT_str_asc** default = "FASCIA ORARIA"
UCPT_tBandMsg2 (or nci09tBandMsg2)
type **SNVT_str_asc** default = "NON VALIDA"
Access time band not active message, row 1 and 2.

UCPT_expiredMsg1 (or nci09expiredMsg1)
type **SNVT_str_asc** default = "VALIDITA'"
UCPT_expiredMsg2 (or nci09expiredMsg2)
type **SNVT_str_asc** default = "SCADUTA"
Card expired message, row 1 and 2.

UCPT_noCredMsg1 (or nci09noCredMsg1)
type **SNVT_str_asc** default = "CREDITO UTENTE"
UCPT_noCredMsg2 (or nci09noCredMsg2)
type **SNVT_str_asc** default = "INSUFFICENTE"
Not enougth credit message, row 1 and 2.

UCPT_pref1 (or nci09pref1) type **SNVT_str_asc** default = ""
Fix code # 1.

UCPT_pref2 (or nci09pref2) type **SNVT_str_asc** default = “”
Fix code # 2.

UCPT_pref3 (or nci09pref3) type **SNVT_str_asc** default = “”
Fix code # 3.

UCPT_pref4 (or nci09pref4) type **SNVT_str_asc** default = “”
Fix code # 4.

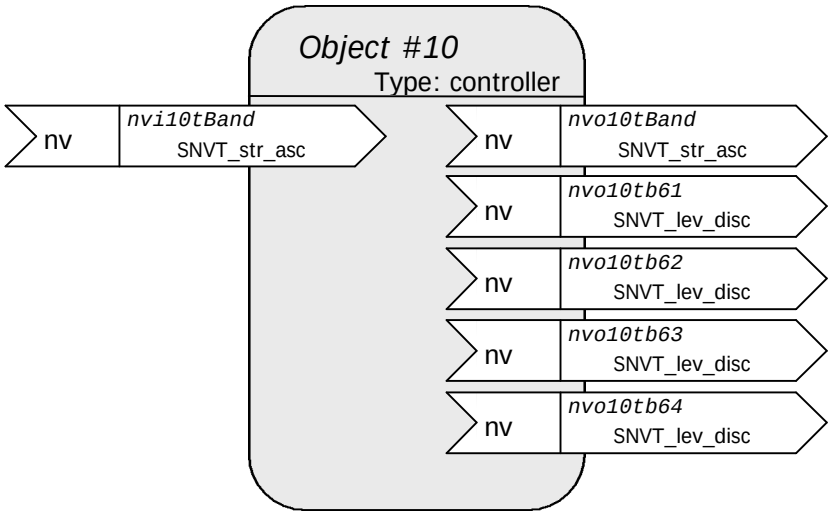
UCPT_pref5 (or nci09pref5) type **SNVT_str_asc** default = “”
Fix code # 5.

UCPT_pref6 (or nci09pref6) type **SNVT_str_asc** default = “”
Fix code # 6.

UCPT_pref7 (or nci09pref7) type **SNVT_str_asc** default = “”
Fix code # 7.

UCPT_pref8 (or nci09pref8) type **SNVT_str_asc** default = “”
Fix code # 8.

Object #10 type: time band controller



The time band controller handles up to 64 differents weekly time bands. Time bands can be used by all the access control objects. In order to provide general purpose time band outputs, time bands state 61 to 64 are read out using 4 SNVT_lev_disc network variables. Each time band has 4 weekly time intervals. When one time interval is active, the whole time band is active as well.

nvi10tBand type **SNVT_str_asc**
This variable is used to add, delete and show a time band. See command description below.

nvo10tBand type **SNVT_str_asc**
This variable shows the command results provided by *nvi10tBand*. See command description below.

nvi10tb61 type **SNVT_lev_disc**
This variable shows the time band #61 state. ST_ON means time band active.

nvi10tb62 type **SNVT_lev_disc**
This variable shows the time band #62 state. ST_ON means time band active.

nvi10tb63 type **SNVT_lev_disc**
This variable shows the time band #63 state. ST_ON means time band active.

nvi10tb64 type **SNVT_lev_disc**
This variable shows the time band #64 state. ST_ON means time band active.

COMMAND DESCRIPTION:

Add time interval:

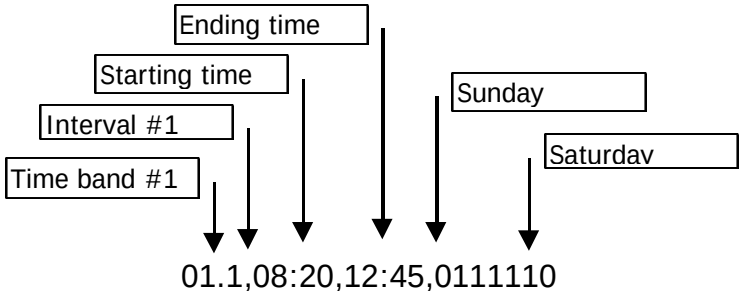
The command syntax to provide to the variable *nvi10tBand* is:

ff.*i*,*hh*:*mm*,*HH*:*MM*,*days*

Where:

ff	time band number(1..64)
.	dot separator
i	time band interval(1..4)
,	Comma separator
hh:*mm*	Starting time in 24 hour notation
HH:*MM*	Ending time in 24 hour notation.
Days	List of the enabled days. 7 characters where the character 0 is used for not enabled days and the character 1 for enabled days. The first character is for Sunday, the second for Monday...; the last one is for Saturday.

Example:



The time interval #1 in the time band #1 is set from 8:30 to 12:45 from Monday to Friday.

Results:

The variable *nvo10tBand* shows the command results.

ff.x,WRONG ARGUMENT	the interval is out of range.
xx.*i*,WRONG ARGUMENT	the time band is out of range.
ff.*i*,WRONG FORMATTED	the ascii[7] or [10] or [13] or [16] do not match.
ff.*i*,WRONG TIME ARGUMENT	time argument are inconsistent.
WRONG COMMAND FORMAT	ascii[5] does not match.
ff.*i*,*hh*:*mm*,*HH*:*MM*,*days*,[ON|OFF]	on command success. The ON or OFF state show the interval activation state.

Query a time band:

With this command we can query the time band activation state or the details for each interval.

ff.*i*? (1 <= *i* <= 4)	shows the interval details
ff.0? (*i* = 0)	shows the time band activation

Results:

ff.x,WRONG ARGUMENT	the interval is out of range.
xx.*i*,WRONG ARGUMENT	the time band is out of range.
WRONG COMMAND FORMAT	ascii[5] does not match.
ff.*i*,*hh*:*mm*,*HH*:*MM*,*days*,[ON|OFF]	for detail view
ACTIVE	for time band query with time band active
NOT ACTIVE	for time band query with time band not active

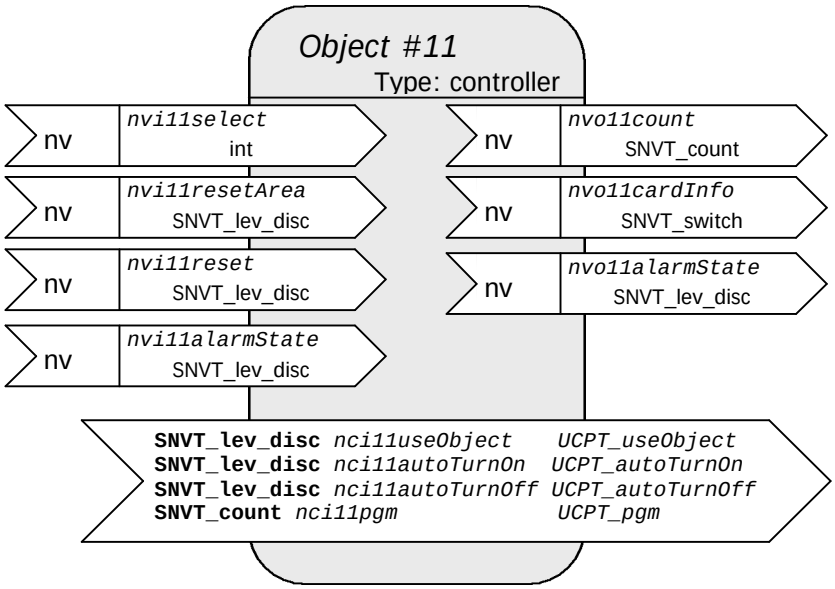
Delete a time band:

ff.*i*D (1 <= *i* <= 4)	delete the interval
ff.0D *i* = 0	delete the time band

Results:

ff.x,WRONG ARGUMENT	the interval is out of range.
xx.*i*,WRONG ARGUMENT	the time band is out of range.
WRONG COMMAND FORMAT	ascii[5] does not match.
ff.0,DELETED	time band deleted
ff.*i*,DELETED	single time interval deleted

Object #11 type: special purpose presence controller



This special controller is used to count people inside a certain area. This kind of controller works in several modes, related to the *nci11pgm* value. At the moment only mode 0 and 1 are enabled. The value 1 is related to card direction detection (see objects 13 and 14 for more details).

Working mode 0:

The object can handle up 20 areas, each area containing up to 15 peoples. When the user accesses through either reader1 or keyboard1 of any access control object, the area related to the user's card memory tag field is incremented of his presence. If the user was already present in the area, the count is not incremented. The same happens when the user accesses through either reader2 or keyboard2, but this time the count is decremented, if the user was present in the area.

When all areas are empty, the object can turn the alarm on. If nobody was present in the area and the alarm was turned on, as soon as an authorised user with enough rights enter the area the alarm can be immediately turned off.

nvi11select type **int**
This variable allows to chose the area.

nvi11resetArea type **SNVT_lev_disc**
When this variable receive an ST_ON update, the selected area is reset to 0 (no presence); if all areas are zero and the *nci11autoTurnOn* = ST_ON, the alarm is turned on.

nvi11reset type **SNVT_lev_disc**
When this variable receive an ST_ON update, all areas are reset to 0 (no presence everywhere) and the alarm is turned on (provided that *nci11autoTurnOn* = ST_ON).

nvi11alarmState type **SNVT_lev_disc**
This variable receives the alarm state from other objects.

nvo11count type **SNVT_lev_disc**
This variable shows the total number of people in the selected area.

nvo11cardInfo type **SNVT_switch**
On update, this variable sends areas occupancy information: the term *value* contains the area number, while the term *state* is 0 if the area is unoccupied and 1 is it is occupied.

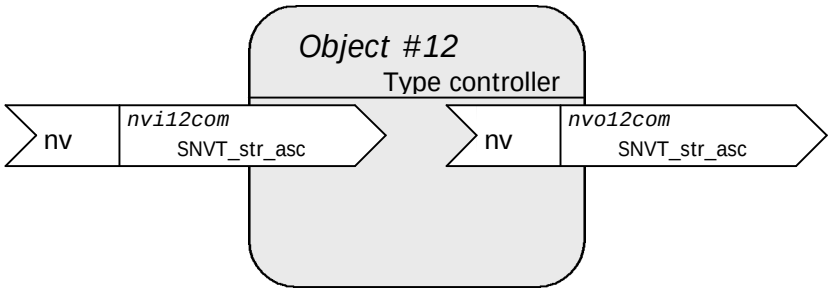
nvo11alarmState type **SNVT_lev_disc**
This variable is used to send the alarm status to other objects.

UNVT_useObject (or nci11useObject)
type **SNVT_lev_disc** default = ST_ON
If this variable is set to ST_OFF the object does not work.

UNVT_autoTurnOn (or nci11autoTurnOn)
type **SNVT_lev_disc** default = ST_ON
If this variable is set to ST_ON, when no presence is detected in all areas (unoccupied), the alarm is turned on. If it is set to ST_OFF the auto turn-on function is disabled.

nci11autoTurnOff type **SNVT_lev_disc** default = ST_ON
If this variable is set to ST_ON, when the first presence is detected in one area, the alarm is turned off. If it is set to ST_OFF the auto turn-off function is disabled.

Object #12 type: controller



This controller is able to estabilish a cominication with other LonServers. For more details see the system guide.

nvi12com type **SNVT_str_asc**

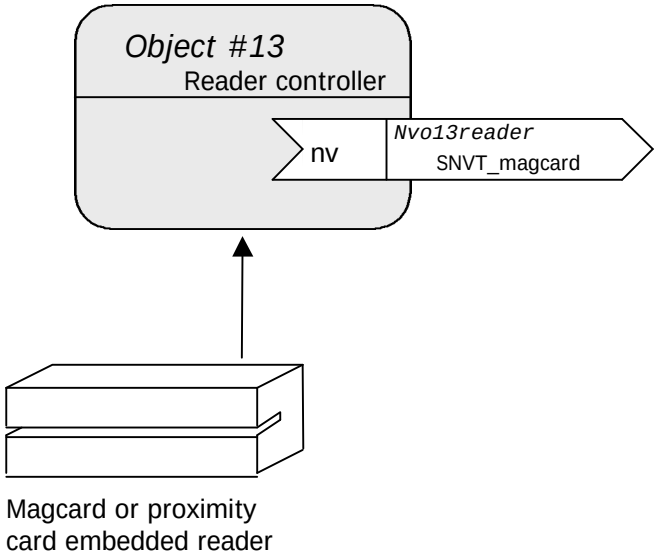
This variable receives information from other LonServers.

nvo12com type **SNVT_str_asc**

This variable sends information to other LonServers.

Object #13 type: Controller

This object interfaces the optional embedded reader in the LonServer device.



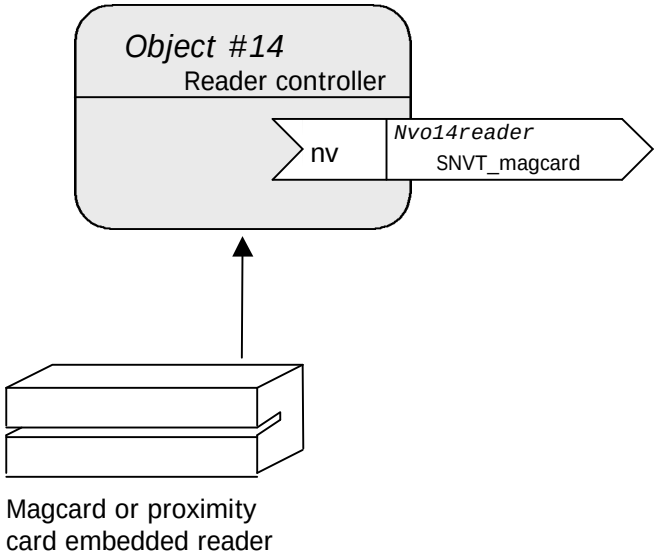
nvo13magcard type **SNVT_magcard**

Each time a card is run in the slot or a proximity card is detected, the *nvo13magcard* network variable is updated. It can be bound to an access control object reader input. (if *nci11pgm* = 0)

If *nci11pgm* = 1 running the card from rigth to left updates *nvo13reader* network variable, running card from left to rigth updates *nvo14reader* network variable. This allows to see two virtual different readers depending from the sweeping direction.

Object #14 type: Controller

This object interfaces the optional external local reader.



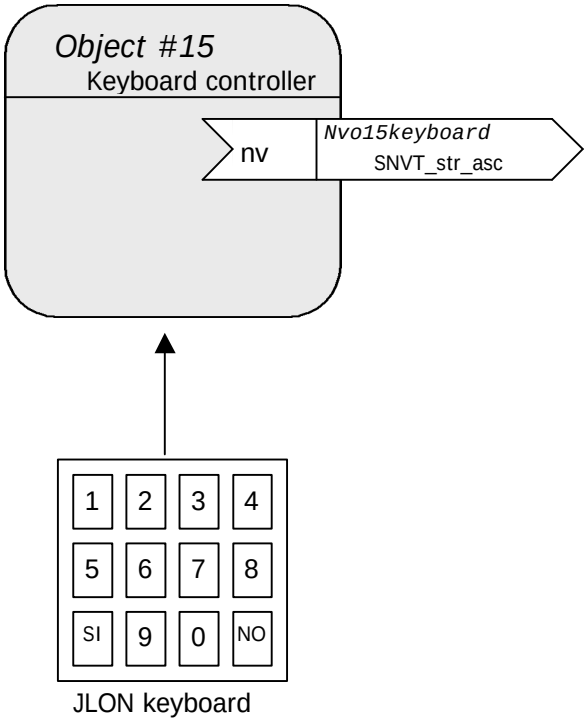
nvo14magcard type **SNVT_magcard**

Each time a card is run in the slot or a proximity card is detected, the *nvo14magcard* network variable is updated. It can be bound to an access control object reader input. (if *nci11pgm* = 0)

If *nci11pgm* = 1 running the card from rigth to left updates *nvo13reader* network variable, running the card from left to rigth updates *nvo14reader* network variable. This allows to see two virtual different readers depending from the sweeping direction.

Object #15 type: Controller

This object interface the local keyboard.

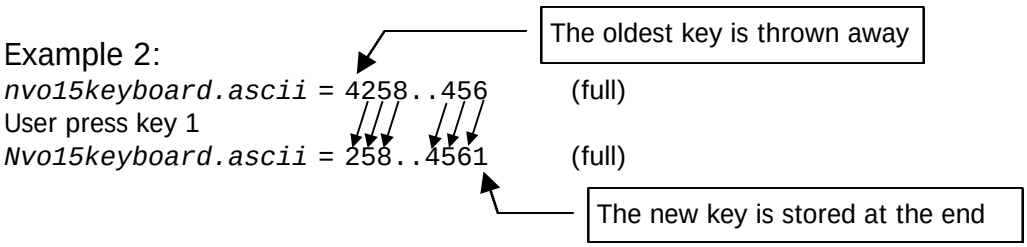


Nvo15keyboard type **SNVT_str_asc**

Each time a key is digit on keyboard, the *nvo15keyboard* network variable is updated. The key pressed is added to the end of the string *nvo15keyboard.ascii* until a maximum 30 allowed characters are not reached. When the string is full, all characters shift by one position and the new data is added to the last position.

Example 1:
Used press 4, 2, 5, 8 keys,
nvo15keyboard.ascii = 4258

Example 2:



It can be bound to any access control object keyboard input.

Apice Building Automation

Via G.B. Vico 45b – 50053 Empoli (FI) - Italy
Phone +39 0571 920442 Fax +39 0571 920474
email: sales@apice.org Home page: www.apice.org