

01 07 Logical link device 800C09**Use of the application program**

Product family: Controller
Product type: Controller
Manufacturer: Siemens

Name: Logical link device N 347/02
Order no.: 5WG1 347-1AB02

Functional description

The logical link device N 347/02 makes it possible to link binary information logically. It uses up to 255 x 1 bit communication objects of type EIS 1, which can be assigned as required to the inputs or the output of up to 126 logic gates. The user is thus not tied to a fixed gate size with a constant number of inputs. He can moreover determine for each logic gate the number of inputs it should have and which logic operations should be carried out.

The user can assign one of the following logic functions to a gate:

AND / NAND / OR / NOR

The inversion (negation) of binary information can be carried out via NAND or NOR gates with only one input. It can also be selected individually for each input whether it is linked directly or inverted.

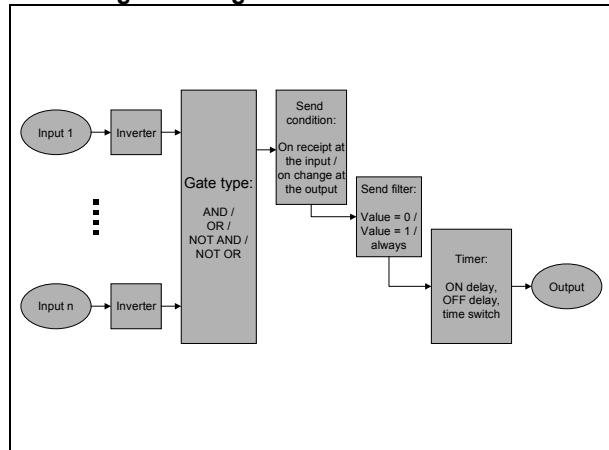
It is also possible to link an input with the output of another gate in order to carry out more complex functions such as EXOR gates or closed-loop flipflop operations. The N 347/02 device listens to switching telegrams on the bus with the group addresses of all the assigned inputs or queries the current value of the group addresses cyclically.

Send conditions (output filter) can be defined for the outputs which describe when the output should generate a telegram.

Time functions can also be activated for each output. It is possible to switch on and off with a delay or the output can automatically revert once it has been switched on (staircase lighting function). The time intervals can be set between 0.1 seconds and 24 hours and can be re-triggered if required.

Using a special supplementary tool which is a component of the Siemens product database and is automatically linked to the device when the N 347/02 is selected in **ET3** (EIB Tool Software, version 1.0 onwards), the user can easily assign parameters to the N 347/02 and load the parameter settings via the EIB into the device.

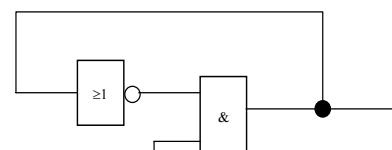
If new versions of ETS or the application program for the N 347 are available, the parameter settings can simply be exported to an XML file. After the update, the exported data can simply be re-imported and is thus automatically transferred to the logical link device without having to repeat the lengthy parameterisation process manually.

Block diagram of a gate**Caution**

Version 9 of the application program may only be downloaded to a logical link device N 347/02. If this application is downloaded into a logical link device N 347/01, the device becomes unusable as a result and must be returned to Siemens AG for reprogramming.

Note

If the programming LED is flashing (0.5 seconds off, 1.5 seconds on) there is a faulty setting of the device in the parameter list. This can lead to the occurrence of logically incorrect links. An example of such a link could be as follows:



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The device cannot determine a clear-cut result in the example shown above. A steady output cannot be produced.

Remedy:

The device must be reloaded with the correct parameter settings.

Note

Version 9 of the application program can only be used together with ETS3. Version 4 of the application program is still available for ETS2.

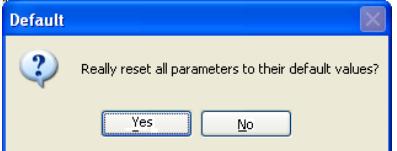
Parameters

The parameterisation of the logical link device N 347/02 is carried out with the help of a supplementary tool which is fully integrated in ETS3 and is started automatically when the ETS3 parameterisation dialog is retrieved.

Parameters which influence the general behaviour of the logical link device N 347/02 are brought together in the **“General”** parameter window.

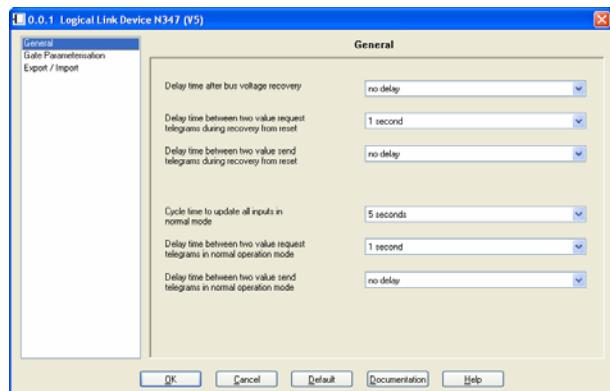
The creation and parameterisation of the individual gates is carried out in the window **“Gate Parameterisation”**, which is retrieved by clicking on the names in the list displayed on the left-hand side.

The buttons on the bottom line of the parameter window have the following function:

OK	Finishes the entry and saves the data.
Cancel	Interrupts the entry, any modified data is not saved. Pressing the ‘Esc’ button on the keyboard has the same effect.
Default	Resets the general parameters to their default values. Before the reset is carried out, the following confirmation dialog is displayed:  The reset of the general parameters is confirmed with “Yes”. Pressing “No” cancels the process.
Grafic	Appears in the mask „Gate Parameterization“ instead of „Default“. With the button „Grafic“ a graphic parameterization interface gets started. (See „Edit gates (graphically) Page 3.11.1.8.3/2“)
Documentation	Retrieves the standard Windows dialog for printing out the documentation. You can find an example of a printout at the end of this description.
Help	Calls up the page-specific help function.

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General

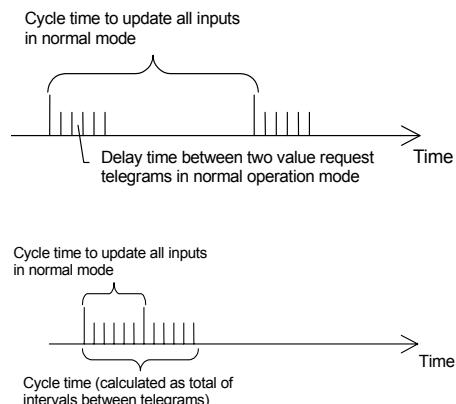


The parameters in the "General" parameter window have the following meaning:

Parameters	Settings
Delay time after reset	no delay 1 second 2 seconds 5 seconds 10 seconds 30 seconds 1 minute 2 minutes 5 minutes 10 minutes
On the one hand, this parameter is used to give the devices (objects) that are to be polled enough time to prepare the object values. On the other hand, the bus load can be corrected by all the bus devices after a reset so that important signals can be processed first.	
Delay time between two value request telegrams during recovery from a reset	no delay 0.2 seconds 0.3 seconds 0.5 seconds 0.7 seconds 1 second 2 seconds 5 seconds 10 seconds 20 seconds
This parameter is also used to monitor the bus load with a timed distribution of the value request telegrams after a reset. The logic operations are only processed once all the objects have been polled.	
Delay time between two send telegrams during recovery from a reset	no delay 0.2 seconds 0.3 seconds 0.5 seconds 0.7 seconds 1 second 2 seconds
All the logic results are sent on bus voltage recovery. As a result, a heavy load can be placed on the bus for a considerable period. In order to avoid this, a delay time can be set here between two send telegrams. The logic operations are not carried out throughout the sending process.	

Parameters	Settings
Cycle time to update all inputs in normal mode	2 seconds 5 seconds 10 seconds 30 seconds 1 minute 2 minutes 5 minutes 10 minutes 15 minutes

The cyclic time for polling input objects is generally set via this parameter. However, if the period for polling all the assigned objects exceeds the "Cycle time to update all inputs in normal mode" due to the "Delay time between two value request telegrams in normal operation mode", the longer period is taken as the cyclic interval.



Delay time between two value request telegrams in normal operation mode	no delay 0.2 seconds 0.3 seconds 0.5 seconds 0.7 seconds 1 second 2 seconds 5 seconds 10 seconds 20 seconds
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This parameter is also used to monitor the bus load with a timed distribution of the value request telegrams after a reset. The logic operations are only processed once all the objects have been polled.

Delay time between two send telegrams in normal operation mode	no delay 0.2 seconds 0.3 seconds 0.5 seconds 0.7 seconds 1 second 2 seconds
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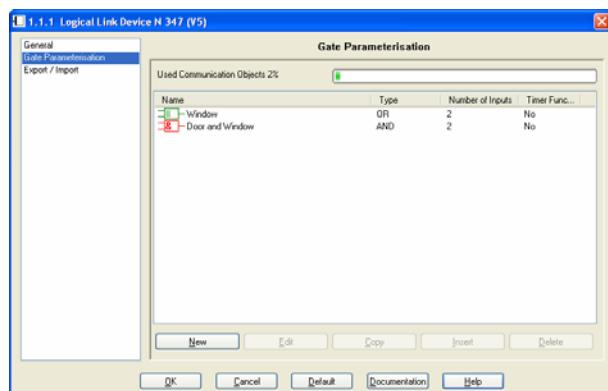
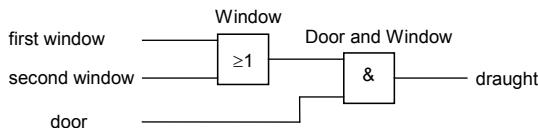
All the logic objects are sent on bus voltage recovery. As a result, a heavy load can be placed on the bus for a considerable period. In order to avoid this, a delay time can be set here between two send telegrams. The logic operations are not carried out throughout the sending process.

Parameterisation of logic gates

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Up to 255 communication objects can be stored in the logical link device N 347/02. All the communication objects are 1-bit objects. These can be defined as inputs or outputs for the gates i.e. each input or output corresponds to a communication object. Each gate can have between 1 and 254 inputs and one output. The maximum possible number of gates is produced from the number of gates that have been configured and the number of inputs that have been assigned per gate. An output can also act as the input of another gate. The input and the output however do not use the same communication object as the assignment is stored internally in a parameter.

The following screens contain this example.



The parameter window **“Gate Parameterisation”** provides an overview of the gates that have already been defined and enables these gates and other gates to be parameterised.

The percentage of the maximum communication objects used is shown as a bar chart.

In principle, the following buttons are available for editing gates, whereby only the buttons that are currently useful can be used:

New New gates can be created by clicking on

	this button. To do so, the window for modifying the gate parameterisation is opened. The new gate is only created if this window is exited by pressing the “OK” button (see section “Editing gates”). If the maximum number of 126 gates has been reached, this button is deactivated.
Edit	If a gate is marked, it can be edited by pressing this button. Double clicking on the gate would likewise call up the edit dialog.
Copy	If a gate is marked, it can be copied via this button. By pressing the “Insert” button, a copy of the marked gate is created.
Insert	Inserts a copy of the previously copied gate with the name ‘<Gate name> (n)’. “n” is a consecutive number which is increased with each copy.
Delete	If a gate is marked, it can be deleted by pressing this button or the delete button on the keyboard (‘Del’).

An overview of the gates that have already been created is displayed in the field on the right-hand side of the parameter window.

The individual columns have the following meaning:

Column	Description
Name	Contains the gate name and a symbol which represents the type of the gate
Type	Indicates whether the gate is an ‘AND’, ‘OR’, ‘NOT AND’ or ‘NOT OR’ gate
Number of Inputs	Indicates the number of inputs for this gate
Timer Function	If a timer function is activated for this gate, this is displayed here (e.g. ON delay or staircase lighting function)

By default, the entries are sorted according to the first column in ascending order. By clicking on a column heading, the overview is either sorted according to this column for the first time or the existing sorting direction is reversed.

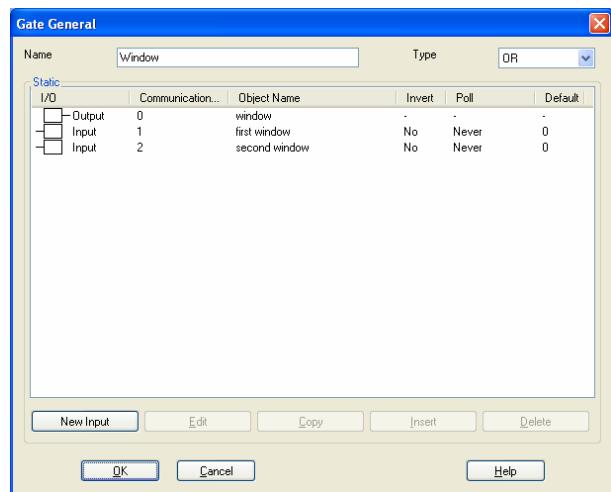
If the text that is to be displayed in a column is longer than the column width, this is indicated by three full stops at the end of the visible text.

The width of the columns in the overview can be modified. If the complete overview should no longer be visible as a result, a horizontal icon bar is displayed. Modified column widths are not saved when the parameterisation has finished so that the original column width is available when the window is retrieved again.

If more gates are created than the number that can be displayed in the window, a vertical icon bar is shown.

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Editing gates (tabularly)



The gate name and the gate type can be entered by the user in the top line of the window. The length of the gate name is limited to 23 characters.

The following functions are available as gate types:

AND
OR
NOT AND
NOT OR

The main field of the parameter window displays an overview of the gate inputs/gate output that have already been created.

The individual columns have the following meaning:

Column	Description
I/O	Indicates as a symbol or text whether it is an input or output.
Communication Object Number	The number of the communication object which is linked to the input or output is displayed here. If the input is linked with an output, the text 'Linked with output' is shown.
Object Name	The name of the communication object which is linked to the input or output is shown here. If the input is linked with an output, the name of the gate of the linked output is indicated.
Invert	It is indicated here whether the input is inverted before it is processed. Outputs cannot be inverted as the gates would otherwise change their type (e.g. an AND gate would become a NOT AND gate).
Poll	It is indicated here whether the input is polled "Never", "After restart" or "Cyclically".
Default	After a restart, the selected input has the displayed value. This value is used to calculate the output value until a new value has been received.

By default, the entries are sorted according to the first column in ascending order. By clicking on a column heading, the overview is either sorted according to this column for the first time or the existing sorting direction is reversed.

If the text that is to be displayed in a column is longer than the column width, this is indicated by three full stops at the end of the visible text.

The width of the columns in the overview can be modified. If the complete overview should no longer be visible as a result, a horizontal icon bar is displayed. Modified column widths are not saved when the parameterisation has finished so that the original column width is available when the window is retrieved again.

If more inputs are created than the number that can be displayed in the window, a vertical icon bar is shown.

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In principle, the following buttons are available below the overview, whereby only the buttons that are currently useful can be used:

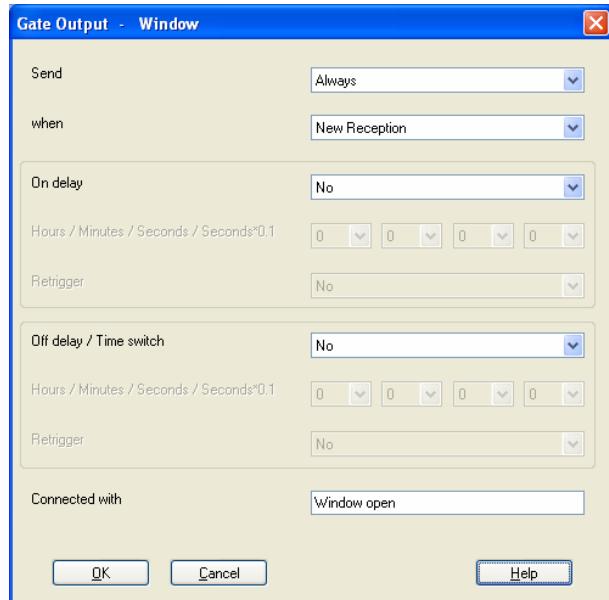
New Output / New Input	If it is a new gate, the output of the gate must first be defined before inputs can be added to the gate. To do so, the window for modifying the output/input parameterisation is opened. The creation is only carried out if this window is exited by pressing the "OK" button (see section "Modifying outputs" or "Modifying inputs").
Edit	If the gate output or an input is marked, it can be edited by pressing this button. Double clicking on the output or input would likewise call up the edit dialog.
Copy	If an input is marked, it can be copied via this button. By pressing the "Insert" button, a copy of the marked input is created.
Insert	Inserts a copy of the previously copied input with the name 'Copy of <input name>'.
Delete	If the gate output or an input is marked, it can be deleted by pressing this button or the delete button on the keyboard ('Del'). If the output is deleted, another output must be created to conclude the editing of the gate.

The following buttons are available at the bottom of the window:

OK	Finishes the entry and transfers the data of the gate. This button is only available if a useful gate parameterisation has been carried out i.e. at least the gate output and one input have been created.
Cancel	Interrupts the entry, any modified data is not saved. Pressing the 'Esc' button on the keyboard has the same effect.
Help	Calls up the page-specific help function.

Editing outputs

The window "Gate Output" enables the parameterisation of a gate output to be modified. The name of the corresponding gate is displayed in the title bar of the window.



The following buttons are available at the bottom of the window:

OK	Finishes the entry and transfers the data of the gate. This button is only available if a useful gate parameterisation has been carried out i.e. at least the gate output and one input have been created.
Cancel	Interrupts the entry, any modified data is not saved. Pressing the 'Esc' button on the keyboard has the same effect.
Help	Calls up the page-specific help function.

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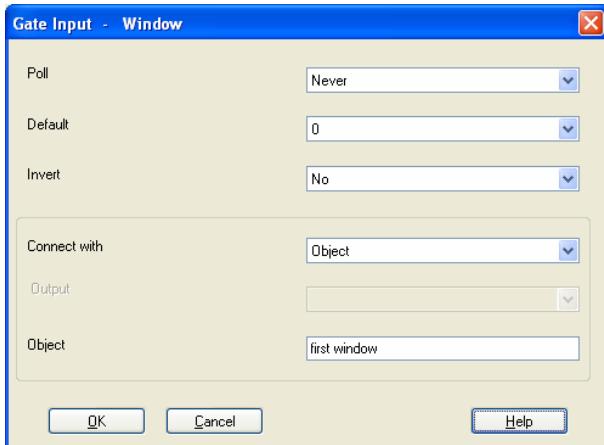
The parameters of the "Gate Output" window have the following meaning:

Parameters	Settings
Send	always if 0 at output if 1 at output
This parameter determines whether the output state is sent in each case, only if the output is 0 or only if the output is 1.	
On	new receipt change at output
This parameter determines whether the output state is sent on receipt of each input telegram or only if the output state has changed.	
ON delay	yes no
If an ON delay is required, it is activated with this parameter. An ON delay means that the "1" telegram is not sent immediately when the filter condition is met at the output but only once the set delay has elapsed.	
The ON delay can also be combined with the time switch function or an OFF delay.	
Hours/minutes/ seconds/seconds*0.1	hours from 0 to 23 minutes from 0 to 59 seconds from 0 to 59 seconds *0.1 from 0 to 9
The ON delay period is set here. This field is only enabled if an ON delay has been selected. The minimum ON delay is 0.1 seconds while the maximum period that can be set is 23:59:59.9.	
Retrigger	yes no
Retriggering means that each time the trigger condition is met, the ON delay is interrupted and restarted. It is set in this parameter whether retriggering is required. This field is only enabled if an ON delay has been selected.	
OFF delay / time switch	no OFF delay time switch
This parameter defines whether the output operates without a delay, with an OFF delay or as a time switch.	
An OFF delay means that the "0" telegram is not sent immediately when the filter condition is met at the output but only once the set delay has elapsed.	
If the gate output operates as a time switch, it waits for the set period after switching on and then sends a "0" telegram automatically.	
Both the OFF delay and the time switch function can be combined with the ON delay.	

Parameters	Settings
Hours/minutes/ seconds/seconds*0.1	hours from 0 to 23 minutes from 0 to 59 seconds from 0 to 59 seconds *0.1 from 0 to 9
The OFF delay period or the period of the time switch function is set here. This field is only enabled if an OFF delay or the time switch function has been selected. The minimum delay period is 0.1 seconds while the maximum period that can be set is 23:59:59.9.	
Retrigger	yes no
Retriggering means that each time the trigger condition is met, the OFF delay or the period of the time switch function is interrupted and restarted. It is set in this parameter whether retriggering of the OFF delay or the time switch function is required. This field is only enabled if an OFF delay or the time switch function has been selected.	
Linked with	
The first part of the name of the communication object which functions as a gate output is defined with this parameter. The complete communication object name as displayed in ETS3 is composed of two parts. The second part is the gate name that has already been assigned. The maximum length of the entry is limited to 23 characters.	

01 07 Logical link device 800C09**Editing inputs**

The window "Gate Input" enables the parameterisation of a gate input to be modified. The name of the corresponding gate is displayed in the title bar of the window.



The following buttons are available at the bottom of the window:

OK	Finishes the entry and transfers the data of the gate. This button is only available if a useful gate parameterisation has been carried out i.e. at least the gate output and one input have been created.
Cancel	Interrupts the entry, any modified data is not saved. Pressing the 'Esc' button on the keyboard has the same effect.
Help	Calls up the page-specific help function.

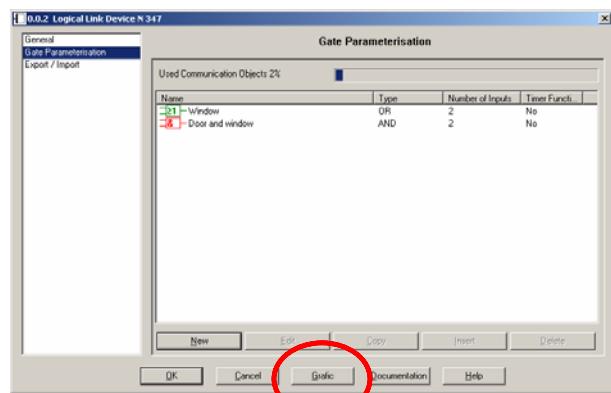
The parameters of the "Gate Input" window have the following meaning:

Parameters	Settings
Poll	never after restart cyclically
Default	0 1
Invert	yes no
Linked with	output object
Output	If the input should be linked directly with the output of another gate, the required link is selected. The outputs of all the other gates are displayed in the list. A direct feedback to the same gate is not possible. This field is only enabled if the input should be linked with an output.
Object	The first part of the name of the communication object which functions as a gate input is defined with this parameter. The complete communication object name as displayed in ETS3 is composed of two parts. The second part is the gate name that has already been assigned. The maximum length of the entry is limited to 23 characters. This field is only enabled if the input should be linked with an object.

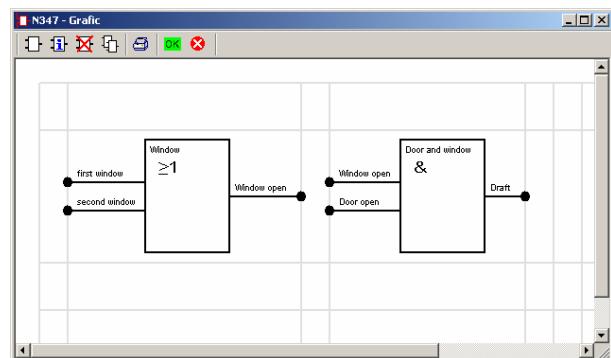
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Editing gates (graphically)

(tabularly see „Editing gates (tabularly) Page 3.11.1.8.3/5)



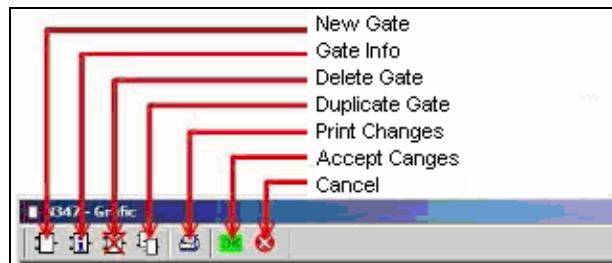
The parameterization dialog of the N347 contains a button 'Grafic' that starts a graphic projecting interface.



It is modally, that means as long as you work with it, none of the sub-windows (down to ETS-main window) can be activated.

Changes in this user interface need to be saved with the OK button there **and**, after closing it, additionally with the OK button in the usual parameterization dialog.

The elements in the toolbar have the following meaning:



New Gate	New gates can be created by clicking this button. Therefore, a window to edit the gate parameterization opens. After leaving this window by pushing the OK button, a new gate gets created (see also „Editing gates“). If the maximum number of 126 gates is reached, this button gets disabled.
Edit Gate	A marked gate can be edited by pushing this button. A double-click on the gate has the same effect.
Delete Gate	A marked gate can be deleted with this button or by using the delete key on your keyboard.
Duplicate Gate	Adds a copy of a marked gate with the name <gate name> (n). „n“ is a running number that gets increased with every copy.
Print Changes	Pushing the print button opens the default Windows print dialog where a printer can be chosen. This offers the possibility to print the gate structure.
Accept Changes	This button hands all changes and settings over to the next sub dialog.
Cancel	A click on cancel discards all changes in the actual working level without questioning again.

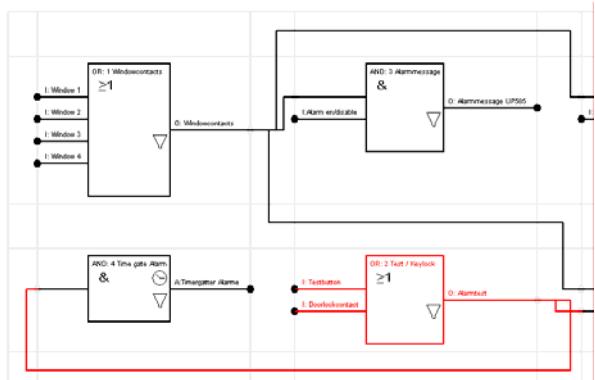
New gate

By clicking the toolbar button for a new gate in the graphic window, the same dialog starts as if one creates a new gate tabularly.

Gates get arranged at fixed positions in the graphic user interface, shown as grey lines in the background.

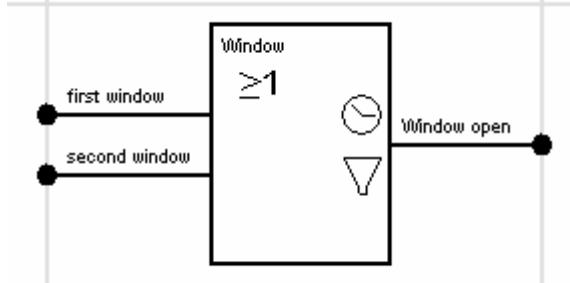
After creating a output and all needed inputs, the gate will be placed at the first possible position. A active (marked) gate is shown red, as well as every incoming and outgoing connections.

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Gates can only be placed at odd positions in the grid. If you number this grid with coordinates like in a table calculation, and you start with (0,0) at the upper left cell, the first gate can be placed into cell (1,1). The even cell numbers are used for connecting lines.

Additionally to the display of the in/output descriptions the type of the gate, timer and filter functions are shown.



The clock symbol shows that a switch-on/switch-off delay has been set for the output

The filter sign appears whenever at least one of the two filter functions is activated for the output..

An inverted input is displayed by a not filled circle.

Gates can be moved by drag & drop via left mouse button. In this action it turns red and a small black square is visible at the upper left corner of the gate symbol. When the mouse button is released, the gate is placed at the current cell it hovers above, unless there is already another gate. In this case the action is cancelled, and the gate is moved back to the previous position.

In case the cell is free, but even numbered, the gate will be placed in the next odd cell.

Edit gate, in- and output

See page 3.11.1.8.3/5
„Edit Gates (tabularly)“

Copy gate

In order not to insert gates of the exact same type & configuration repetitiously from scratch, the active gate can be duplicated.

This is done by clicking on the “Duplicate” – button in the toolbar, or by the key codes “Ctrl + C” to copy and “Ctrl + V” to paste. Then there will be a new gate with the properties of the old one, and it will be made the current gate.

Prior to duplication, the DLL will check if sufficient free properties are available to complete the action successfully. If not, a warning will pop up.

Delete gate

There are two possibilities to delete a gate. Either by marking a gate and clicking the delete button in the toolbar, or by marking it and clicking the delete button on the keyboard.

If the input of a gate is connected to the output of a deleted gate, a warning will be shown and the erasing procedure will be canceled.

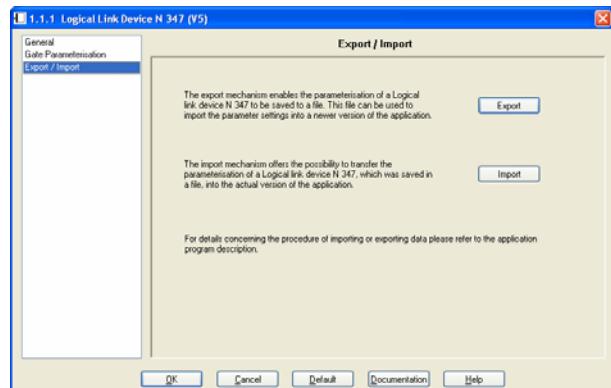
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Import / Export

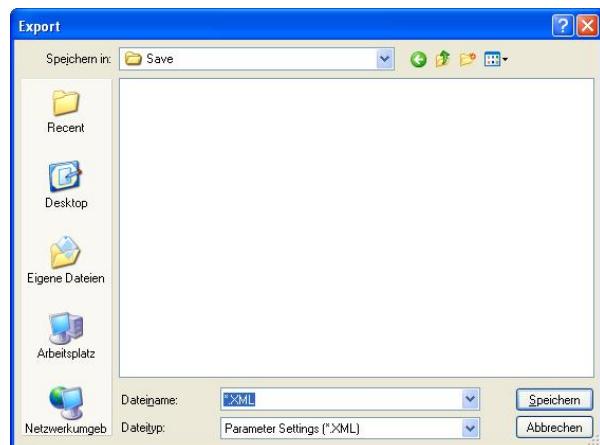
The logical link device N 347 enables all the settings that have been carried out, i.e. all the gates, designations, parameters and group address links to be exported to a file.

An exported configuration can likewise be transferred to the current N 347 database entry using an import process.

An update of the ETS software or application program can thus be carried out without having to repeat the entire parameterisation.



After pressing the “**Export**” button, the standard dialog for saving files is opened:



The file is saved in the so-called XML format which is a standardised file format that enables a simple evaluation of the stored data.

When importing an XML file, any entries that have been carried out previously are overwritten. A security query prevents unwanted data loss:



Note

To be able to import an exported data set of a logical link device N 347, all the group addresses which are used in the relevant N 347 should already have been created in the current project.

If group addresses are not present, they are indeed created and linked but the original designations of the group addresses are unknown so that an exact recreation of the original parameterisation is not possible in this case!

If the same group addresses are used differently in the original project and in the current project, this can lead to an apparent malfunction of the installation.

When updating an existing project from ETS2 to ETS3, the following procedure is recommended:

- Export the configuration of the existing logical link devices in this project (use a meaningful name e.g. with reference to the physical address)
- Delete the logical link devices in the current project
- Export the rest of the project
- Import this project into ETS3
- Import the new application program of the logical link device for ETS3
- Insert the previously deleted logical link devices to the project
- Import the exported configuration into the relevant devices

01 07 Logical link device 800C09**Communication objects**

The communication objects of the logical link device N 347/2 are created dynamically. The name of the communication object is composed of two parts:

- The first part is the gate name.
- The second part is specified in the dialogs "Gate Output", input field "Linked with" or "Gate Input", input field "Object".

The communication, write, transmit and update flags are set by default for all communication objects.

Number	Name	Group Addresses	Object Function
0	Window - Window open		Link object
1	Window - first window	1/1/1	Link object
2	Window - second window	1/1/2	Link object
3	Door and Window - draught	1/1/101	Link object
5	Door and Window - door open	1/1/3	Link object

The linking of the communication objects with group addresses is carried out as usual with the standard ETS3 tools.

Max. number of group addresses: 253
Max. number of communication objects: 255

The maximum number of communication objects is greater than the number of available group addresses that can be linked. The maximum number of communication objects can therefore only be reached if at least two gate inputs are directly linked with gate outputs.

Note

The outputs of the logical link device N 347 behave like sensors which automatically send the correct value. A direct polling of the values stored in the communication objects is not provided and does not return the correct result under certain conditions (e.g. due to active time delays or send filters)!

October 2006

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Printed documentation of the example (first page)

Device Info N 347

Logical Link Device N 347 (V5) / Siemens / 5WG1 347-1AB02

Physical address: 1.1.1 / Appl. programme: 800C05

General Parameters:

Delay time after bus voltage recovery:	no delay
Delay time between two value request telegrams during recovery from reset:	1 second
Delay time between two value send telegrams during recovery from reset:	no delay
Cycle time to update all inputs in normal mode:	5 seconds
Delay time between two value request telegrams in normal operation mode:	1 second
Delay time between two value send telegrams in normal operation mode:	no delay

Name: Window
Type: OR

Output

Communication object number / name:	0 / Window - Window open
Connected with group address:	
Send:	Always
when:	New Reception
On delay:	No
Off delay / Time switch:	No

1.Input

Connect with:	Object
Communication object number / name:	1 / Window - first window
Connected with group address:	1/1/1;
Poll:	Never
Default:	0
Invert:	No

2.Input

Connect with:	Object
Communication object number / name:	2 / Window - second window
Connected with group address:	1/1/2;
Poll:	Never
Default:	0
Invert:	No

Name: Door and Window
Type: AND

Output

Communication object number / name:	3 / Door and Window - draught
Connected with group address:	1/1/101;
Send:	Always
when:	New Reception
On delay:	No
Off delay / Time switch:	No

1.Input

Connect with:	Output
Output:	Window
Poll:	Never
Default:	0
Invert:	No