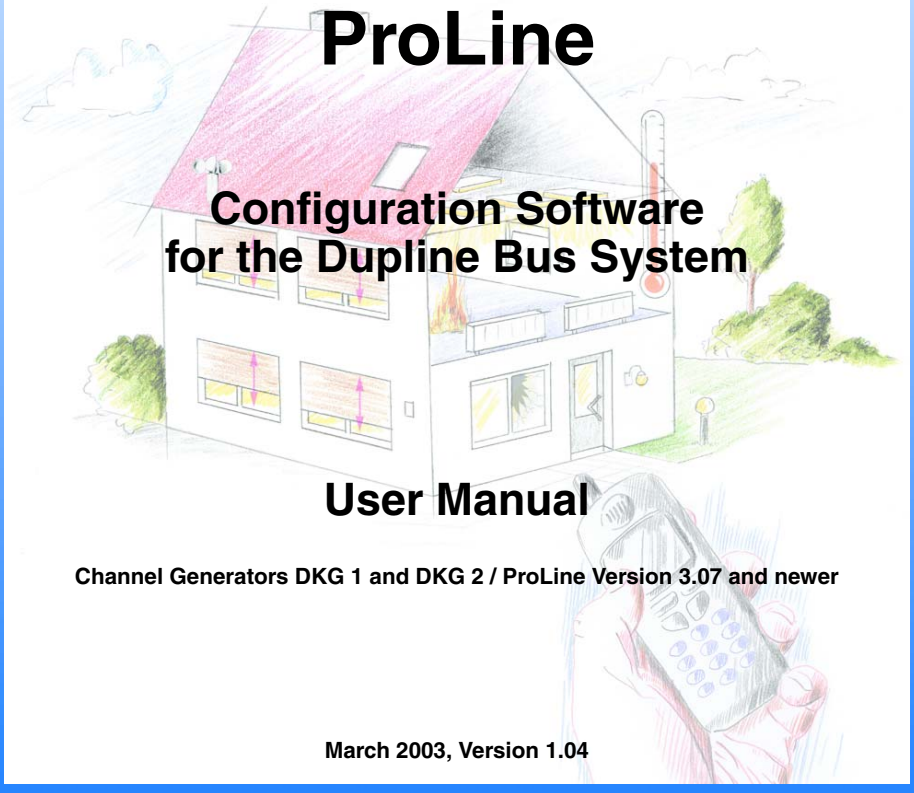
Doepke

ProLine

Configuration Software for the Dupline Bus System



User Manual

Channel Generators DKG 1 and DKG 2 / ProLine Version 3.07 and newer

March 2003, Version 1.04

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Chapter 1 Introduction

1.1 What is ProLine?

Nowadays building automation systems are sprouting up all over the place, with each new system placing ever-higher demands on both the user and the installer. Dupline is different: with this bus system our objective has been to create a user-friendly environment and provide practical application options.

But Dupline nonetheless offers numerous possibilities to carry out and affect settings, thus retaining the flexibility of a bus system. This is done with ProLine, our Windows® based software programme which is available free-of-charge and which could be termed the "interface" between man and the Doepke Dupline system - or, more accurately: the channel generator.

1.2 About this Document

To make working with Dupline as easy as possible for you, the user, this manual explains the operation and functioning of ProLine in great detail.

As ProLine is continually undergoing further development, several versions are already in existence which have added or amended functions. In order to keep this manual as clear as possible we have limited it to the newest ProLine version (Version 3.07) for channel generators DKG 1 and DKG 2 of version 3.0 and higher.

Please note that versions 1.xy and 3.xy of the channel generators and the ProLine software differ in many points.

There are some subjects, however, which exceed the scope of this document. Because of differing national settings and installation configurations, the range of Windows® based installations is so extensive that not every specific version within ProLine can be covered. We trust you will appreciate this.

To ensure that the manual is kept up-to-date Doepke will assist you in every way: utilize our telephone support hotline, our e-mail update service, or the information available at http://www.doepke.de always to be at the cutting edge.

1.3 Conventions

For reasons of clarity, and in order to facilitate reading, here are some set markings relating to working with Windows®. As far as possible these conventions are adhered to throughout the document.

Start	Over and underlined terms signify special keys or menu items (also called "buttons"). You will find these either in Windows® or ProLine.
"*a:setup*"	Texts shown in inverted commas, printed in bold or italics, describe what has to be entered. The inverted commas serve merely as text limit markers and do not need to be entered.
<File><Save>	Texts set in greater than/smaller than symbols, printed in bold or italics describe menu items or menu sequences which are necessary. The specified commands generally signify multi-level menu items.

1.4 Abbreviations and Terminology

Abbreviation	Description
BCD-Code	Binary Coded Decimals. In data processing this is a code in which all the digits of a decimal number are represented by a four-line binary number (tetrad). The addition of two coded decimal numbers is carried out by tetrad for each individual digit.
Checkbox	Box within a dialogue field that may be ticked (activated) or deselected (de-activated). Several checkboxes can be activated simultaneously. See also radiobutton.
COM1/COM2/ COM3/COM4	Communication port: plug-in connectors on the PC to enable it to be linked to other communication partners.
Cursor	Marker (pointer or similar) on the screen showing at which point the next input will be.
I/O	Input/output General term for components on bus systems.
FPROM	Flash Programmable Read-Only Memory: memory module which - by applying a voltage - is permanently programmed with data.
Icon	Graphic symbol for user programmes, data etc. on the screen.
ISA	Formerly: "Instrument Society of America", now "Instrumentation, Systems, and Automation Society" - a society for the standardization of instruments and systems in automating technology.
LCD	Liquid Crystal Display
LED	Light Emitting Diode: a semiconductor diode which emits light.
CET/CEST	Central European Time/Central European Summer Time.
Modbus	Protocol for exchanging data via serial ports; the basic protocol "Modbus I RTU" was standardized by Messrs. Gould Electronics.
Object	Used in this document to denote a function, i.e. the execution by the software of an input or output, e.g. a roller-blind control. In ProLine many devices have a specific object assigned to them in order to make available certain settings which are decisive for the functioning of the device.
Radiobutton	For the selection of several activating fields, only one of which can be called up at any one time.
Split I/O	Split Inputs/Outputs: A feature of the Dupline bus system: input and output of each channel are normally independent of each other. A connection between both directions is achieved only after configuration of the channel generator.
Touch Screen Panel	Screen by which commands can be entered via direct contact with the screen surface.

1.5 Documents Used

Reference	Description	
[1]	Dupline Product Information and Planning Aid	DPHR1001
[2]	Dupline System catalogue (Carlo Gavazzi International)	CAT DUP GER 13 06/00

Chapter 2 Basics

2.1 ProLine

2.1.1 Versions

ProLine is closely linked to the system software of the channel generators - basic functions can only be added by simultaneously changing both the channel generators' and the ProLine software. Such a change occurred when version 1.xy was replaced by version 3.xy. The correlation between DKG 1/DKG 2 and ProLine is as follows:

DKG 1/DKG 2 Version	ProLine Version
up to 1.04	1.03
3.xy	from 3.07

We emphatically advise you not to configure "new" channel generators with ProLine version 1.xy, or "old" channel generators with ProLine version 3.xy: this could result in unforeseen consequences.

2.1.2 System Requirements

ProLine has the following operating environment requirements:

	Requirements
PC	• IBM compatible PC • 486 processor minimum (preferably: Pentium or Athlon) • 8 MB RAM minimum • 5 MB free hard disk space minimum • mouse • floppy disk, CD or DVD drive for installing ProLine • 1 free serial port (COM1, COM2, COM3 or COM4)
Monitor	• resolution 640 x 480 Pixel minimum • 256 colours minimum
Operating system	• Microsoft Windows® 95/98/ME/NT 4.0/2000/XP

In other words: ProLine can be installed and started using standard computers, provided Windows® 95 or a newer Microsoft operating system has been installed. This also applies, of course, to notebooks and laptops, where it must be specifically ensured that a free serial port is available.

2.1.3 Installing the Software

The ProLine software is available on our Building System CD or free of charge via the Internet at http://www.doepke.de, where you will always find the latest version.

To initiate the installation, click on the link and select "Open" at file download. Then follow the instructions of the installation assistance.

Although it is normally possible to install several ProLine versions in one PC, we recommend that you always use the latest version and erase older versions before installing newer software.

2.2 The "Dupline Principle"

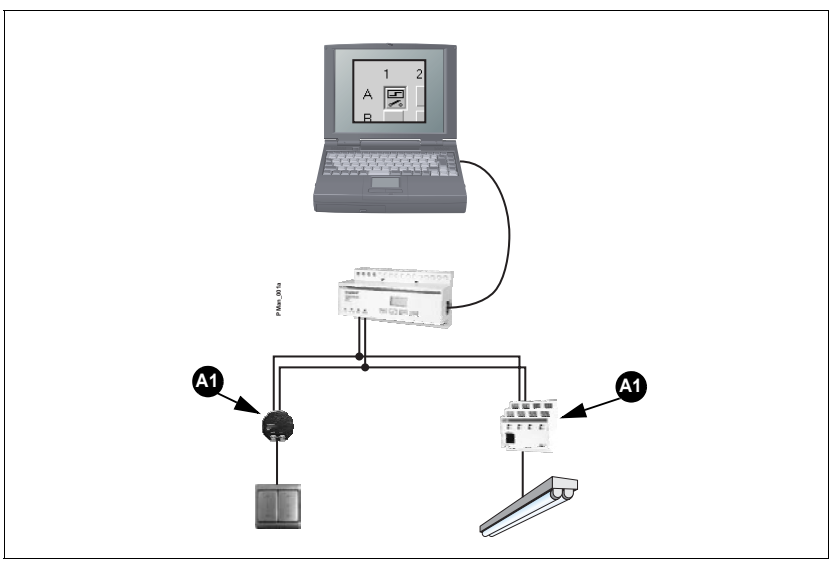
Dupline consists of three components:

1. a central unit (channel generator)
2. inputs and outputs, and
3. a transmission medium, e.g. a twin-wire lead.

In its basic condition, i.e. not configured, the channel generator merely generates the Dupline carrier signal used for communication. Most input and output devices have no intelligence of their own either.

The allocation of an input channel to the output channel which it is to control is carried out by assigning an address with the DHK 1 hand encoder. Normally both channels will be given the same address within the range A1 to P8. Any inputs which are to be used in addition to switch this output, and all outputs which are to be so switched, are then given this same address.

In this way inputs and outputs know that they are to act together, albeit not in which manner. The exact way in which they function is determined at the channel generator and requires a configuration file which is provided by means of ProLine and which is then loaded. Using the example of a simple light switch, the following diagram illustrates the interaction of all components:



To implement this light switch layout proceed as follows:

1. Connect the push-button to input T1 of an operating signal sensor and code the first channel to address A1.
2. Connect the lamp to the first output of a relay module (e.g. DSM 2) and code the first channel also to address A1.
3. In ProLine configure channel A1 as a push button function and transfer the application to the channel generator.

This procedure can be taken as the basis for all other applications. There are, of course, an infinite number of possible variations.

For further details on communication and layout of the Dupline bus system refer to the Dupline Planning Aid, which we will be happy to send to you, or download the information from our website at http://www.doepke.de.

Chapter 3 Operation

3.1 General Information

With ProLine we have created a user interface which has been kept deliberately simple whilst, at the same time, offering a host of options for setting the parameters of installation objects.

The main features of ProLine are:

- two-window layout,
- little menu depth,
- efficient shortcut keys, and
- help text for all objects and setting options.

To sum up, ProLine could be called an easy-to-use "tool" - and, as with all tools, it is essential to learn how to handle it. This chapter is intended to support you in this.

3.2 Start-up and Exiting

3.2.1 Starting

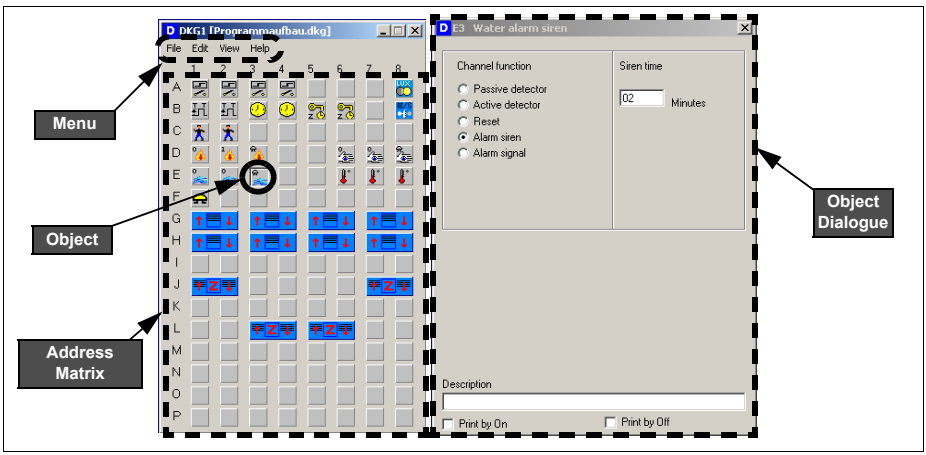
After successful installation (see **Chapter 2.1.3 "Installing the Software"** on **Page 4**) you will see the icon for ProLine in the Windows® start menu under ***<Start><Programs> <Doepke Schaltgeraete><Pro-Line>*** which appears as follows:

Doepke --- ProLine 3.07

Click this entry with the mouse or select it with the keyboard, and ProLine will start.

3.2.2 Programme Construction

After starting ProLine two programme windows will appear. The following picture illustrates the layout in principle; however, in the window on the right the start page has already been replaced by an object dialogue:



The Menu permits direct access to general functions of the programme, e.g. to open, save or print files. Here you can also specify the settings for holidays and languages.

The Address Matrix shows the channels of the Dupline system; here specific functions - or more accurately Objects, such as motion detectors - are assigned to the channels. For each of such objects the right window, or the Object Dialogue, provides the relevant mask.

3.2.3 Exiting

Menu:	***<File><Exit>***	**Keyboard:**	**Alt+X**

There are three options for exiting from ProLine:

1. By means of the menu sequence ***<File><Exit>***,
2. By Clicking "x" in the upper right hand corner of the left programme window, or
3. By using the shortcut key **Alt+X**.

It is immaterial which one of these you select - in each case you will be asked whether you want to save any changes made in the configuration data.

3.3 The Help System

The Help system makes itself "known" at many points within ProLine:

- General description,
- In the Help menu ("General Information"),
- For each object, and
- For each special setting option ("context-related help").

3.3.1 General Description

Information concerning the programme and contact addresses can be accessed via the ***<Help><About program>*** menu sequence. The information is displayed on the right programme window and will also automatically open after starting the programme.

The following information will be displayed:

- Doepke's telephone/fax number and e-mail address, and
- The version of the programme currently in use, e.g. "3.00"

3.3.2 General Information

General help can be accessed via the ***<Help><General Information>*** programme sequence and provides the following information:

- Procedure to add objects,
- Keyboard shortcuts, and
- Additional tips.

The individual points will be explained in detail in the following chapters.

3.3.3 Help with Objects

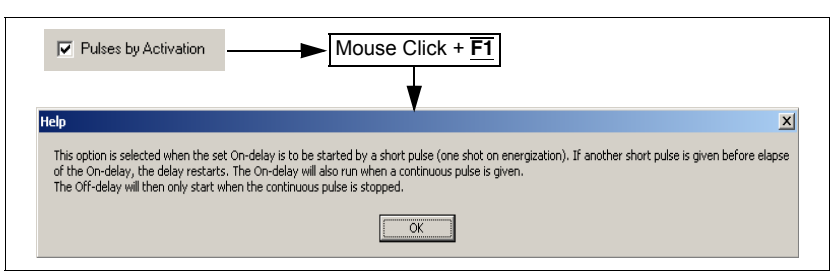
Press **F1** to get a detailed description of every object entered in the left programme window. Firstly, however, it must be ensured that the object has been correctly selected, i.e. it is frequently necessary to click the icon of the object with the left mouse button.

Note: In the case of objects with several components, such as e.g. an intruder alarm with active detector, passive detector etc., the help relates to that particular type. Thus, there are different help texts for active and passive detectors (normally-closed and normally-open-contacts).

3.3.4 Help for every Setting Option

Many Help texts are also available in the r.h. window of ProLine: Help is provided for each individual setting option of every object by clicking at the object and then pressing the **F1** key.

The following illustration demonstrates this using the timer as an example: by selecting the Pulses by Activation followed by pressing **F1** the Help text below appears:



3.4 Selecting the Language

The default language of ProLine menus and Help texts is German. There are two options for switching to other languages:

1. English, Danish and German can be selected directly via the menu.
2. Other available languages, e.g. Polish, may be added via a dialogue box.

3.4.1 Direct Selection

Menu: ***<View><Language><...>*** **Keyboard: no shortcut**

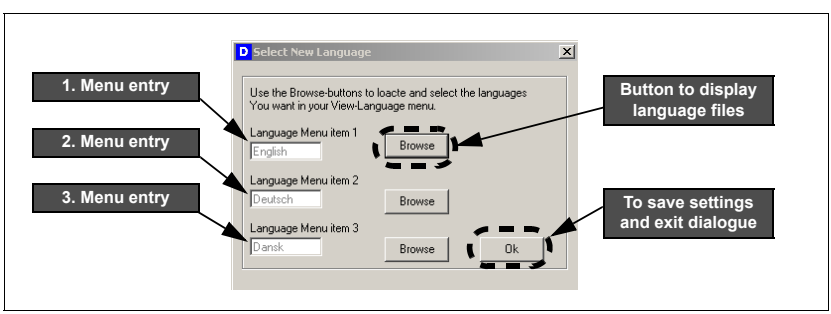
By following the ***<View><Language>*** menu sequence you can directly access any languages already defined.

Here, too, the language ticked is the one currently selected.

Note: The selection in this menu may vary - depending upon the languages set-up with ***<Select New>***. Please refer to the following chapter.

3.4.2 Select New

In order to adapt it to the country in which it is being used, ProLine provides an option in the ***<View><Language><Select New>*** menu which enables you to change the predefined language selection (see chapter above). If you select this menu item, the following dialogue will appear in the left programme window:



The menu entries 1 to 3 can be changed with the relevant Browse button on the left. By clicking with the mouse on one of the buttons an "Open file" dialogue will appear, which then permits another language file to be selected. The names of the language files are always in the format "<language>.dat" e.g. "english.dat" or "deutsch.dat"[1].

1. Depending upon the set-up of your computer, it may be that you are unable to see the "dat" suffix. The set-up can be changed in the folder options (system control).

When selecting new language files please observe the following:

- There must be a Help file - in the same folder.
  The name of this Help file must consist of the first three letters of the Language file together with the suffix "_hlp.dat", thus e.g. "eng_hlp.dat" if the Language file name is "english.dat".
- The Help and Language files may be neither erased nor the folders renamed. Should this occur, however, error messages such as "Error by reading Language file" or "Error by reading Help file" will appear when the program is next started. Instead of menu headers only numbers will be displayed, e.g. "<- 1-->.

3.5 Files

In addition to the language files, ProLine can only recognize the application files ending with "dkg". These files can be opened, saved and printed in the ***<File>*** menu.

3.5.1 Starting a New File

Menu:	***<File><New>***	**Keyboard:**	**Ctrl+N**

Via the command ***<File><New>*** you can always start a completely new application. ProLine deletes all objects in the matrix and also resets to the basic settings.

Note: With ProLine version 3.00 all previously made settings will be overwritten without query. Any settings you do not want to lose should be saved beforehand.

3.5.2 Opening an Existing File

Menu:	***<File><Open>***	**Keyboard:**	**Ctrl+O**

You can open an already existing file - in the same way as other Windows® applications - by using the command ***<File><Open>***. A dialogue box will then appear which enables you to navigate your hard drive. Another possibility of opening an existing file is offered via the "History" option in the ***<File>*** menu: here the four files last opened are displayed and can be directly accessed.

Note: Opening a file will also overwrite any previously made settings. Any settings you do not want to lose should be saved beforehand.

3.5.3 Saving Files

Menu:	***<File><Save>***	**Keyboard:**	**Ctrl+S**
	<File><Save as...>		**Ctrl+A**

With the ***<File><Save>*** menu item you can save new or edited applications either on hard drive or floppy disk. If the file already exists, it will be overwritten; if it is a new file, you will be asked for a file name.

With the ***<File><Save as...>*** menu item, on the other hand, you can save the current application under a new name. Here, too, you will therefore be asked for a file name.

3.5.4 Printing File

ProLine supports you in providing project documentation by automatic printing of various lists. The print-out will always be on the standard printer set up at the time of printing. This means that the data output can be directed to the usual inkjet or laser printers, but also into a file, e.g. as PDF file.

The following options are available:

Command	Printout
<File><Print> <Address Listing>	• Objects such as e.g. push button (toggle switch) function, motion detector, analog sensors, alarm systems, decentral, i.e. local, roller-blind Up-Down controls • Parameters for each object, e.g. roll time, input range, limits

Command	Printout
<File><Print> <Master Channels>	• All master commands, i.e. master functions and central roller-blind controls • Parameters for each object
<File><Print> <Realtime Channels>	• List of holidays • All real-time facilities with switch times
<File><Print> <Logic Settings>	• List of logic connectives: the notes will be printed to the right of each setting (please refer to **Chapter 5.4 "Notes and Documentation"** on **Page 99**)
<File><Print> <SMS Setup>	• Parameters for the SMS message with phone numbers, dial-out mode etc.

3.6 Working with Objects

The term "object" can mean a range of things. In the context of ProLine we refer to functions which are assigned to the channels, or addresses, as "automating objects", or "objects" for short. Typical examples are the push button or toggle switch functions, the motion detector and the roller-blind control.

At each of the 128 addresses you can insert an object, but it must, of course, be appropriate for the hardware which has been configured with this address.

To breathe "life" into the application there are various operations which can be carried out with it. These are explained in detail in the following chapters.

3.6.1 Inserting Objects

There are two options for inserting an object into the left hand matrix field:

- via the right mouse button
- via a letter key

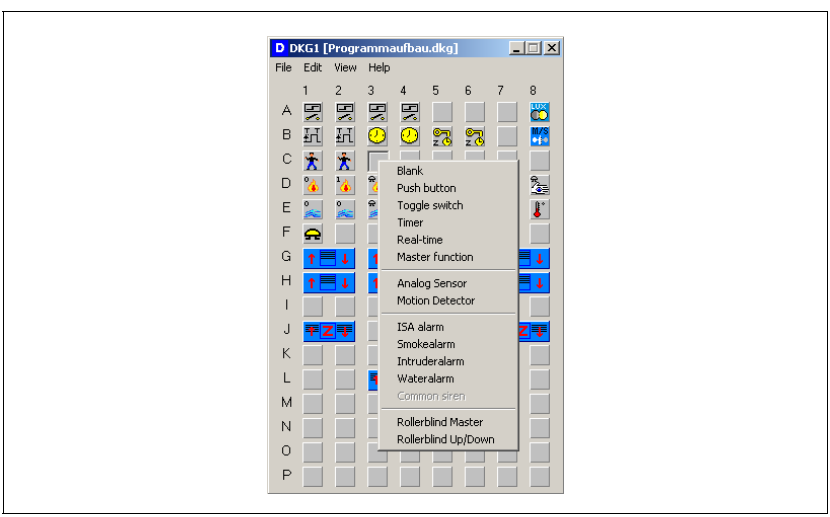
Which option you choose depends on your personal preference.

Inserting with the mouse

Inserting with the mouse requires the following steps:

1. Position the mouse pointer on the address where you want to insert the object.
2. Press the right mouse button.
3. From the List which appears select the relevant object.

With ProLine version 3.xy the selection we have made for address B1 appears as follows:



When the selection has been made the appropriate icon for the chosen object appears together with, on the right hand side, the associated configuration parameters.

Inserting via the keyboard

With ProLine objects may also be inserted by pressing a single key. To do so proceed as follows:

1. Click once at the address where you want to insert the object.
2. Now press the key assigned to the object (see table below) you want to insert.

3. If you want to insert further objects in this way, just press again another relevant key.

The following objects can be inserted by pressing a key:

Key	Object
<I>	Intruderalarm
<S>	Smokealarm
<A>	ISA alarm
<R>	Real-time (clock)
<0> (Null)	Push button
<F>	Toggle switch
<T>	Timer
<W>	Wateralarm
<M>	Master function

3.6.2 Changing Objects

To edit the configuration of an object ...

... click the object in the left matrix field using the left mouse button. On the right hand side a dialogue field with parameters will appear which you can then change.

To exchange one object for another ...

... click the object in question with the right mouse button and select a new one from the menu which appears.

3.6.3 Deleting Objects

Channels can be "erased" by removing their function. To do so configure the object "Blank" for the relevant channel in the address matrix.

3.6.4 Setting Parameters

To set the parameters for ProLine objects you can usually proceed according to the rules summarized in the following table:

Field	Action	Description
Channel Address	Enter	• Position the cursor • Type in letter and channel number
	Invert	• Position the cursor • Press - (minus) key
	Delete	• Position the cursor • Press **Del** or - (minus) key
	Change	• Position the cursor • Overtype letter and channel number

Field	Action	Description
Times/Dates	Enter	• Position the cursor • Type in numbers
	Change	• Position the cursor • Overtype numbers
	Delete	• Position the cursor • Press **Del** or **-** (minus) key
	Next Field	• Press **TAB** or **Enter**

3.6.5 Copying, Cutting and Inserting Text

One of the few instances where working with ProLine differs from using Windows® is the editing of e.g. descriptive text, because here no shortcut keys (**Ctrl+C**, **Ctrl+X**, **Ctrl+V**) can be used.

Instead, for these tasks please use the functions which appear in the menu when clicking with the right mouse button at the relevant box.

3.7 Channel Generator Settings

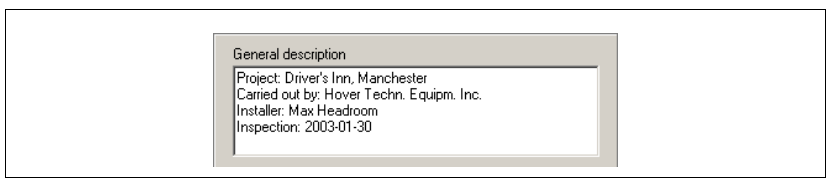
This chapter describes the settings which ProLine saves together with the application in the channel generator. These are mainly:

- General description regarding the application (project data)
- Holiday set-up
- Communication settings

The latter are described in **Chapter 3.8 "Channel Generator Communication"** on **Page 17**.

3.7.1 General Description (Project Data)

For general details on the application, e.g. project name, executor, date etc., the "General Description" field provides space for text of up to 255 characters to be entered in the basic set-up. This can be accessed via the sequence ***<Edit><Basic set-up>*** and appears as follows:.



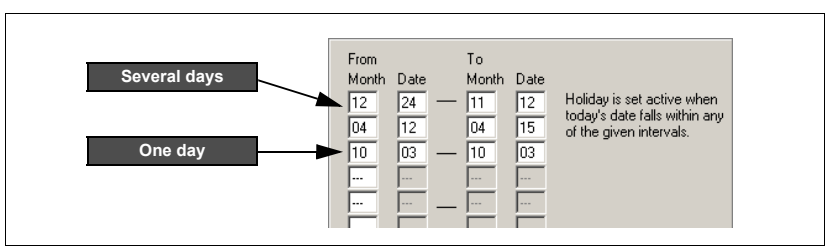
3.7.2 Holiday Set-up

Holidays and vacations, for which special arrangements can be set up in the real-time objects and in the real-time facilities of the master function, are set separately in the ***<Edit><Holiday Set-up>*** menu. They apply to the whole application and are stored in the channel generator during downloading.

The real-time channels are only activated during the specified holiday(s) when

- the On time is been passed and
- the "H" has been selected in the weekday settings.

The dialogue window appears as follows:



Note: It is necessary to confirm the first entry of a month or day with the **Enter** key - only then can the field to the right be edited.
When the fields have a white background you can use the **TAB** key to "jump" to the next field.

To change the data select the relevant box and simply enter the new data; to delete entries use the **Del** or **-** (minus) key.

3.8 Channel Generator Communication

3.8.1 Transferring the Application with the PC

3.8.1.1 Selecting the Serial Port

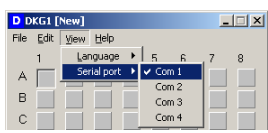
Menu: ***<View><Serial Port><...>*** **Keyboard:** **no shortcut**

ProLine requires two things in order to be able to communicate with the channel generator:

1. a connecting cable between the serial port of the PC (COM1 to COM4) and the channel generator (Doepke DKK 1, Order No. 09 501 129), and
2. a free serial port.

Decide which connection you want to use - e.g. COM1. These ports are normally marked at the rear of your PC.

Having selected the port, ProLine needs to be set up accordingly. This is easily done via the menu command ***<View><Serial port>***. Here you can then select between ***<Com 1>*** and ***<Com 4>***.



The port marked with a tick is the selected connection.

Tip: The COM1 port is normally selected during installation so that, if you want to use COM1, no changes need to be made.

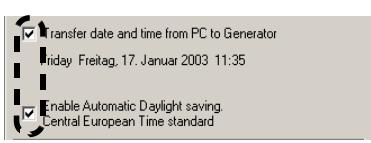
Note: If you have only one 25-pole connection available, you can convert this to a 9-pole connection by using Doepke's DDK 3 adapter (Order No. 09 501 142).
If your notebook or PC offers only a USB interface, you will require a USB-RS232 converter (usually in the form of a small plug) as well as a software driver. This is normally supplied with the unit and emulates a COM interface for actuating the channel generator.

3.8.1.2 Synchronising Time and Date

There are two options for setting the channel generators real-time and date.

1. Via the push-buttons at the front of the DKG, and
2. When transferring the application.

The latter is carried out when the following settings are made in the ***<Edit><Basic set-up>*** menu:



The settings are as follows:

Transfer date and time from PC to Generator
With every transfer of the application, the PC's date and time is read and imported into the channel generator. If the date/time setting in the PC is incorrect, it will also be transferred incorrect to the DKG.
Enable Automatic Daylight saving. Central European Time standard
This setting instructs the channel generator to adapt to summer and winter time in line with European regulations. This means that: • Start of summer time: on the last Sunday in March from 2 p.m. to 3 p.m. CET • Start of winter time: on the last Sunday in October from 3 p.m. to 2 p.m. CET.

3.8.1.3 Transferring Application to Channel Generator

Menu: ***<File><Write Generator>*** **Keyboard:** **Ctrl-W**

Once all employed channels have been configured, the application or file can be transferred to the channel generator. This is done with the command ***<File><Write Generator>***.

Warning: Transferring an application may cause devices to switch randomly on or off. Therefore, always ensure that no persons or animals are within the danger area.

Prerequisites for the perfect transfer are:

- Using the correct version - please refer to **Chapter 2.1.1 "Versions"** on **Page 4**;
- The correct connection from the PC via the DKK 1 cable;
- The correct selection of the port in ProLine (see **Chapter 3.8.1.1 "Selecting the Serial Port"** on **Page 17**).

Should the transfer nonetheless be unsuccessful, it is normally helpful to switch the channel generator off and on again and then retry the transfer.

3.8.1.4 Reading the Application from the Channel Generator

Menu: ***<File><Read Generator>*** **Keyboard:** **Ctrl-R**

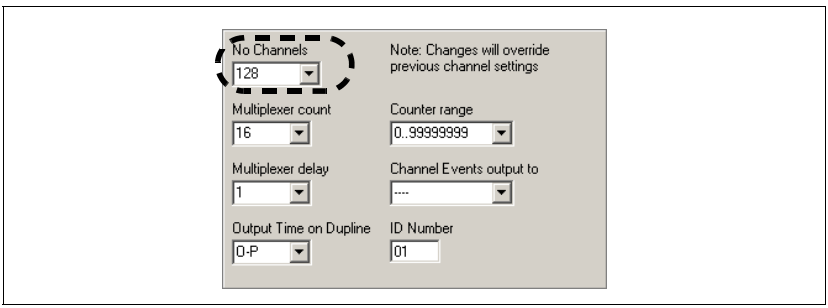
Upon transfer, the application is permanently saved so that it can be retrieved even years later. Provided the above specified requirements for the transfer are met, the read-back process can be initiated via the ***<File><Read Generator>*** menu item.

After reading the application from the generator it can be modified or saved. With ProLine the standard term for such an application is "Upload" - it would be better for you to select a more descriptive name for the file when saving.

3.8.2 Number of Dupline Channels

Regarding communication via the Dupline signal lines, the menu ***<Edit><Basic set-up>*** enables a con-

siderable quantity to be changed - the number of Dupline channels.



With this set-up menu you can adjust the system to meet the requirements of your application by setting the channel number to a figure between 16 and 128. It is thus possible at any time to adapt it to Dupline and to provide for better clarity when not all channels are required.

3.8.3 Linking Two Channel Generators

3.8.3.1 Description

A very simple method of increasing the number of Dupline channels is to interconnect two channel generators or two Dupline systems. This is accomplished via the serial interface of the channel generators so that neither the GSM modem nor a visualising device can be connected in parallel to it.

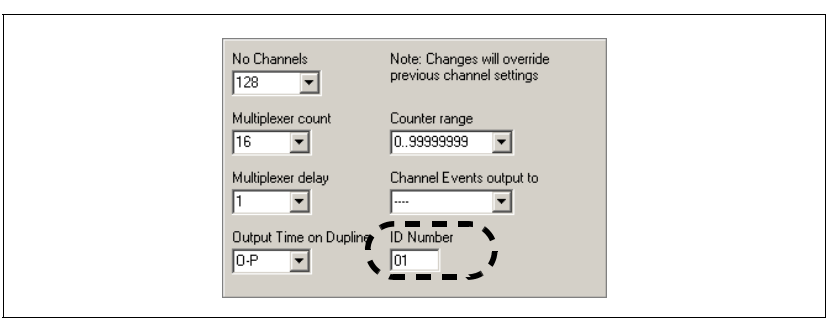
To configure two Dupline networks proceed via the following steps:

Step 1: Connecting the hardware

Correctly connect the channel generators using the DKK 2 cable.

Step 2: Setting the device ID number

In both channel generators the ID number in the ***<Edit><Basic set-up>*** menu must be set to"0".



Step 3: Configuring channels for data exchange

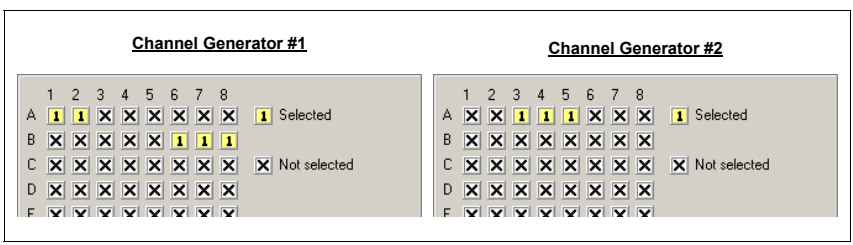
Menu:	*<Edit><Two DUPLINE-Networks>*	Keyboard:	Ctrl+D

Basically, each of the two channel generators knows the channel states of the other's network. In the transfer matrix in the ***<Edit><Two DUPLINE-Networks>*** menu it should now be specified which channels are also to result in the activation of the current system's own channels.

Note: It is necessary to enter in one channel generator those channels that are to be set by the other channel generator, i.e. which are to be 'imported'.
In this case a "1" identifies the activated channels and an "X" the non-selected channels.

Attention: Under no account may a channel be selected in both channel generators as this would result in the signal's latching.

The following illustration shows a configuration example of both channel generators:



Channel Generator #1:

Channels A1, A2, B6, B7 and B8 will be set in its own system if they have been set in channel generator #2.

Channel Generator #2:

Channels A3, A4 and A5 will be set in the system of generator #1 if they have been set in channel generator #1.

Step 4: Configuring channel objects

All that is now missing is a suitable configuration of those channels which are to be switched by the other system. Generally speaking, output modules can already be switched when operating the object "Blank" (see **Chapter 4.2.1 "Free Channel ("Blank")"** on **Page 27**).

Which objects you finally utilize depends upon your application; the signal of the other system always behaves in the same way as if an input module were acting on its own channel.

3.8.3.2 Example of an Application

Task: Two linked channel generators are to be configured in such a way that the master commands "On" and "Off" from the second system are also known in the first.

Solution: Configure the channel transfer in the first channel generator (#1) as shown in the illustration above. Channels A1 and A2 are then configured in both systems as master functions.

Channel Generator #1

Datei: *two_nets_1.dkg.*

Object	Significance	Channel	Notes / Configuration
Inputs/Outputs			
Relay output	Lights	B1..C8	Modules DSM 1U/DSM 2/DSM 4E,R/DSM 8
ProLine Configuration			
Master function	Master ON channel	A1	Channels B1 to C8 are switched on.
Master function	Master OFF channel	A2	Channels B1 to C8 are switched off.
Toggle switch	Switching channels	B1..C8	-
Two Dupline-Networks			Activation of channels A1/A2.

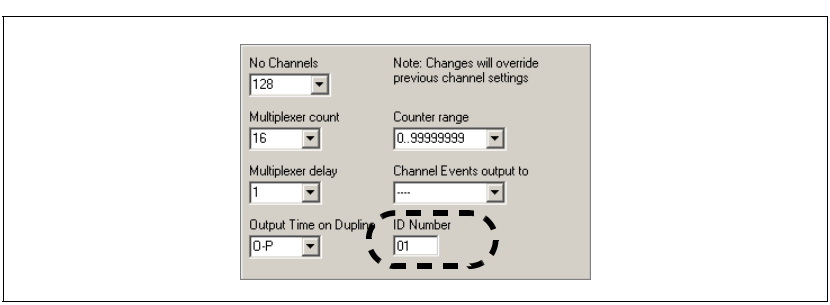
Channel Generator #2

Datei: *two_nets_2.dkg.*

Object	Significance	Channel	Notes / Configuration
Input/Output			
Push-button	Master ON push-button	A1	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
Push-button	Master OFF push-button	A2	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
Relay outputs	Lights	E1..F8	Modules DSM 1U/DSM 2/DSM 4E,R/DSM 8
ProLine Configuration			
Master function	Master ON channel	A1	Channels E1 to F8 are switched on.
Master function	Master OFF channel	A2	Channels E1 to F8 are switched off.
Toggle switch	Switching channels	E1..F8	-

3.8.4 Visualizing via Touch Screen or PC

The Modbus communication protocol available at the serial port of the channel generator offers many possibilities for visualization. A prerequisite of a properly functioning data exchange via modbus is the correct setting of the slave address at the channel generator. This is carried out in the setting "ID Number" in the "Basic set-up" dialogue window which is accessed via the menu sequence ***<Edit><Basic set-up>***:



The ID number of the device must be between "01" and "99" and must match the number in the visualizing software.

Note: If several channel generators are operated on one network, each ID number may be allocated only once.

Please refer to the Planning Aid [1].

3.8.5 SMS Setting for GSM 8

The Dupline modem GSM 8 provides for remote polling and operation of a Dupline system via the SMS messages of a mobile telephone. The modem communicates directly with the channel generator at the serial interface - it is therefore not possible to run either two Dupline networks or to operate a visualizing component in parallel. You will find a detailed description in the Dupline Planning Aid and Operating Instructions of the GSM 8.

To configure the GSM operation proceed via the following steps:

Step 1: Hardware set-up

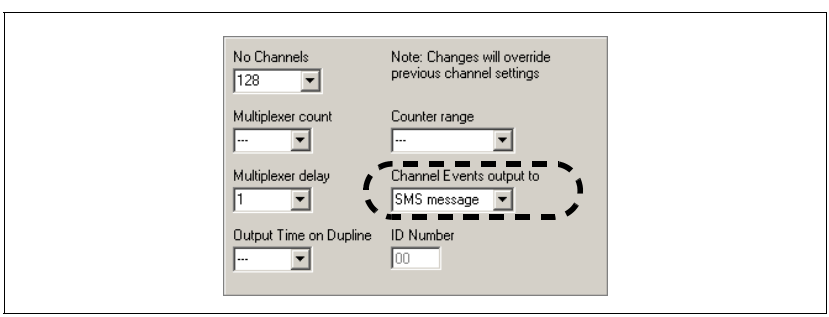
First prepare the GSM 8:

- Insert a valid SIM card for SMS operation with PIN code "9090";
- Connect to a standard mobile phone antenna;
- Connect the GSM 8 to the power supply and the channel generator.

Before installing the SIM card in the GSM 8 you should check it with a standard mobile phone - if available - and, if necessary, clear the code.

Step 2: Set "Channel Events output to SMS message"

In order to gain access to the GSM settings, you must first configure the channel events output for GSM operation in the basic set-up (accessible via ***<Edit><Basic set-up>***).

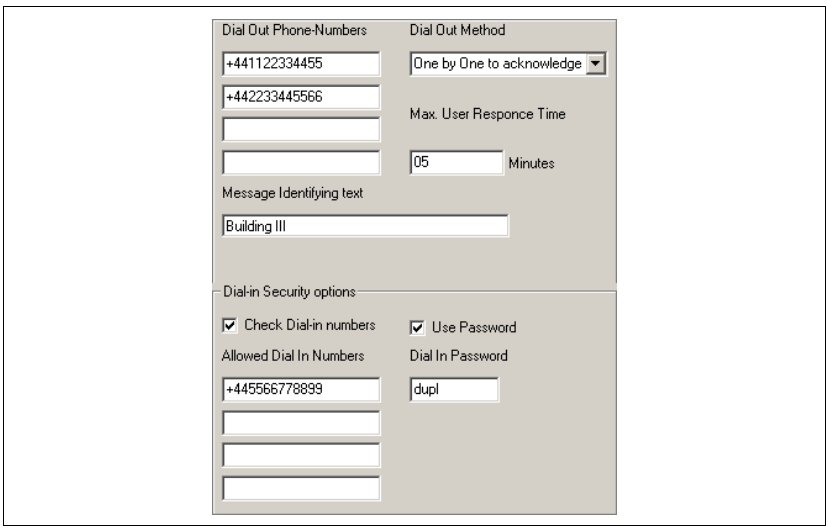


Step 3: SMS Setup

Menu:	***<Edit><SMS Setup>***	**Keyboard:**	**Ctrl+M**

Only when the first step has been carried out can the dialogue ***<SMS Setup>*** be opened via the ***<Edit>***

option. The dialogue window appears as follows:



The following parameters can be set:

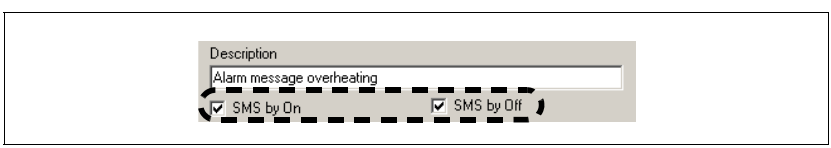
Dial Out Phone-Numbers	
	Enter here up to four mobile phone numbers which are to be called in the event of configured status changes. Here you can enter only numbers and the "+" for the country code - no other symbols are permissible and will be highlighted in red.
Dial Out Method	
Simultaneously	In this mode the SMS message is sent in sequence to all entered phone numbers.
One by One to acknowledge	In this mode the numbers are repeatedly contacted until an acknowledgement is received from one of the listed numbers. Such acknowledgement can be an SMS with any content. The interval between calling the numbers can be specified with the setting "Max. User Response Time".
Max. User Response Time	
0..30 min	Enter here the time that the modem should wait before sending the SMS to any other phone number. The permissible setting is between 0 and 30 minutes.
Message Identifying text	
	This freely selectable text of up to 31 characters is transmitted along with the SMS to identify its source.

Check Dial-in numbers	
	This option must be activated before the system can be controlled via mobile phone. Only when activated will an incoming SMS be accepted from the mobile phone numbers listed underneath.
Allowed Dial In Numbers:	
	Here you should enter the call numbers of mobile phones which are to be allowed access to the Dupline system. Please note that in order to utilize the control facility, the transmission of the mobile phones' own numbers must have been activated on the phones. As the provider also transmits - in most cases - the country dial code (e.g. "+49" for Germany), this should also be entered in the box.
Use Password	
	Assign a password to increase the security of your system. Every incoming SMS must then be accompanied by this password.
Dial In Password	
	Here you can enter the password which safeguards all incoming SMS. A maximum of 4 characters or numbers is permissible.

Step 4: Setting SMS events

So far it is already possible to change and request the switch states of the system via a mobile phone. If, because of specific channel states, an SMS notification is also to be emitted, then this needs to be configured individually for each channel concerned.

The set-up options for SMS operation will be found at the bottom edge of the configuration dialogue and will look something like this:



Note: If the above "SMS by ..." option is not shown, you have either selected a master or decentral roller-blind control, or have not carried out the above detailed **Step 2 "Set "Channel Events output to SMS message""**.

Only with roller-blind controls is the generation of SMS messages at On/Off slopes not possible. Otherwise the following applies:

SMS by ...	Description
On	The GSM modem generates an SMS message when the appropriately configured channel is switched **on**. The message contains the SMS ID name, the channel description followed by the status "On".
Off	The GSM modem generates an SMS message when the appropriately configured channel is switched **off**. The message contains the SMS ID name, the channel description followed by the status "Off".

Chapter 4 The Objects

4.1 Overview

4.1.1 General Information

In this chapter we would like to introduce to you the objects available in ProLine. In **Chapter 3.6 "Working with Objects"** on **Page 13** we have already shown you how to use them. Linking these objects to each other is described in **Chapter 5 "Logic Set-Up"** on **Page 94**.

The objects are grouped as follows:

Standard Objects..... Chapter 4.2 ..... Page 27
Here you will find simple objects for push buttons, toggle switches, real-time (clock) or timer controlled actuators and the straightforward master function.

Special Objects..... Chapter 4.3 ..... Page 43
This chapter explains objects such as analog sensors and motion detectors.

Alarm Systems ..... Chapter 4.4 ..... Page 52
Are you looking for a reasonably priced alarm system? Read here how to configure and operate Dupline alarm systems.

Roller Blind Controls ..... Chapter 4.5 ..... Page 78
Here the decentral and master roller-blind controls are described in detail.

Counters and Time..... Chapter 4.6 ..... Page 87
What are multiplex meter count transfer, analog multiplexer or time output? You will find the answers in this chapter.

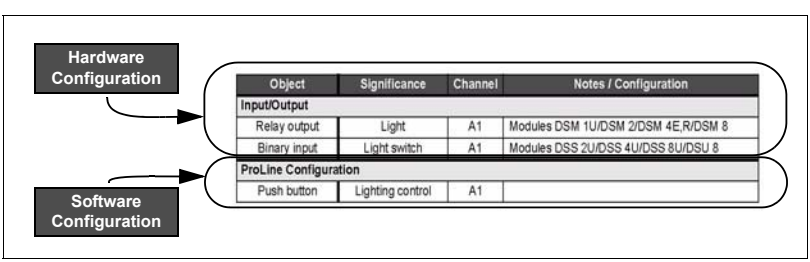
4.1.2 Object Descriptions

4.1.2.1 Parameters

In the object description you will find all available set-up options, also called parameters. The selection possibilities may differ - according to which ProLine version is being used. You will find a description of how to deal with the parameters in **Chapter 3.6.4 "Setting Parameters"** on **Page 14**.

Example of an Application

Application examples are given for most objects. They are intended to illustrate how a task can be accomplished with the described object.



These examples all illustrate just a small section of Dupline's range of functions; in addition, many tasks

can be solved in a variety of other ways.

Listed in the **Object** column are either the Dupline object (e.g. input) or the ProLine object (e.g. push button function). The **Significance** this object has for the example briefly explains the function.

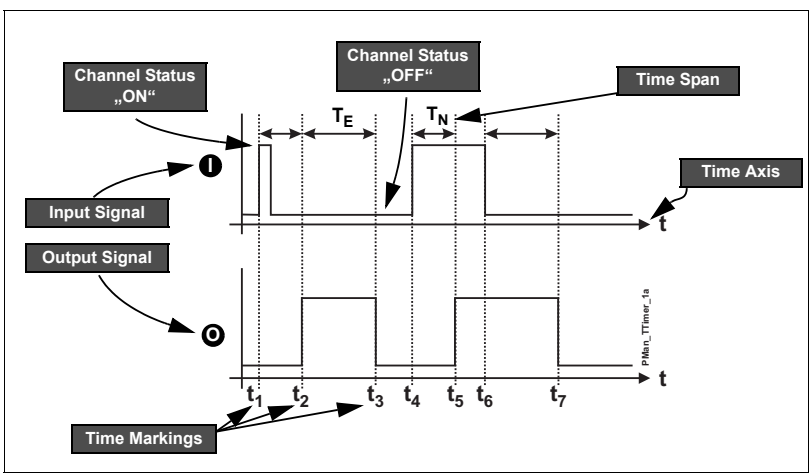
The **Channel** column specifies the address at which the function is carried out. Under **Notes/Configuration** you will find information on the implementation and on components which could be used for this. However, because of the diversity of components we cannot provide a complete list in this manual.

For most of the examples you will also find channel generator files available; these can be installed in addition to this manual.

4.1.2.2 Timing Characteristics

For each object you will find a timing item. This is intended to give you an overview of the dependencies between input and output signals.

Because of the many other parameters, these dependencies can only be represented qualitatively; the diagrams therefore have no time graduations but simply markings with identifying lower-case letters (e.g. t_1, t_2, ...).



Time spans, on the other hand, are marked with capital letters (T_E, T_N). The status of the channel can be established by the signal states ("On": high level, "OFF": low level).

Note: The time lag due to the transfer and the processing in the channel generator is normally not illustrated. It can amount to several bus cycles.

4.2 Standard Objects

4.2.1 Free Channel ("Blank")

- Function: None.
- Application: To activate output channels by master functions or logic connectives.
- Inserting with the mouse ("Blank").

Description

It might sound funny, but it is a fact: even the object "Blank" has a purpose in ProLine.

The point is that here, too, input and output are independent of each other. As this object does not fulfil a function between input and output, any input configured with this address will have no effect.

It is however possible to control this channel - and thereby also the outputs coded with this address; this can be either via the master function (see **Chapter 4.2.6** on **Page 39**) or as an output for logic connectives (see **Chapter 5** on **Page 94**). Additionally, a channel thus configured can also serve as a monostable marker.

Parameters

None.

4.2.2 Push Button

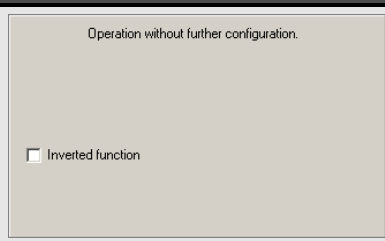
- Function: Monostable flipflop (wipe pulse).
- Application: Connection of switches and contacts in order to switching loads, e.g. via operating signal sensors DSS 2U, DSS 4U, DSS 8U.
- Can also be operated as an inverted function.
- Insertion either with mouse ("Push button") or shortcut key "0" (zero).

Description

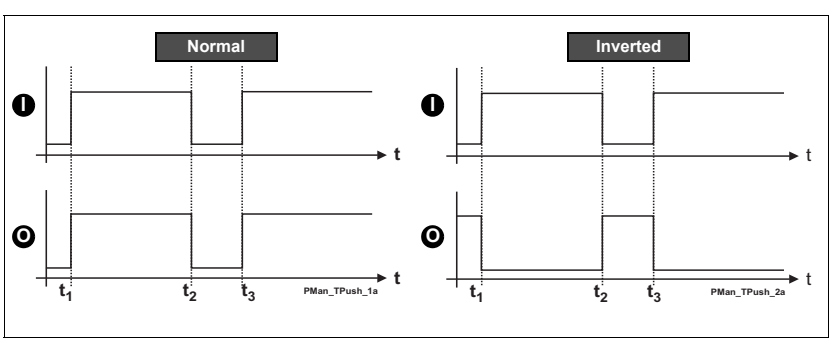
The push button function is the simplest object of the channel generators and enables switches and contacts of any kind to be connected to the Dupline bus. Outputs can be operated indirectly with this function, e.g. via logic connectives.

With this function the output lags slightly behind the input signal: it is active as long as the input signal is present (the reverse applies with the Inverted function).

Parameters

Parameters	Description
Push Button	
Inverted function	If this function is ticked, the output signal will be inverted. This means that the output is activated as long as the input has **not** been set.

Timing Characteristics



The output follows the input with a slight delay. With the inverted function the behaviour of the output to the input is inverted.

Example of an Application

Task: A light is to be switched on and off with a conventional switch.

Solution: Use e.g. the DSS 2U flush-mounted operating signal module for the input of the operating signal and configure an input with the address A1. An output of a relay module (e.g. DSM 8) is assigned the same address. Then all that is required is to configure channel A1 in ProLine as a push button function.

Object	Significance	Channel	Notes / Configuration
Input/Output			
Relay output	Light	A1	Modules DSM 1U/DSM 2/DSM 4E,R/DSM 8
Binary input	Light switch	A1	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
ProLine Configuration			
Push button	Lighting control	A1	

4.2.3 The Toggle Switch

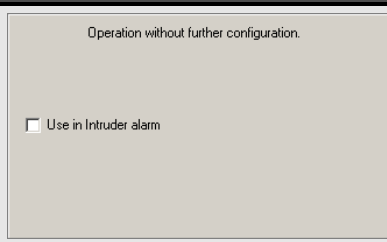
	• Function: Bistable flipflop • Application: To connect switches and contacts for switching loads, e.g. via operating signal sensors DSS 2U, DSS 4U, DSS 8U. • Can also be operated as a signal contact in the intruder alarm system • Insertion either with mouse ("Toggle switch") or shortcut key "F".

Description

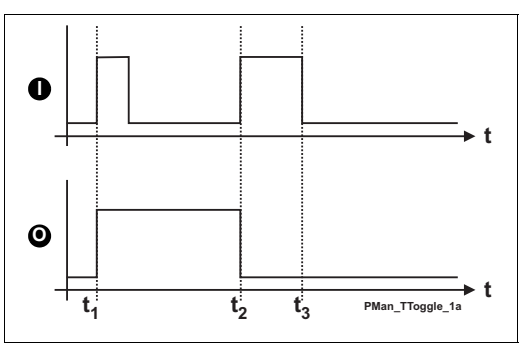
This function permits the characteristics of a toggle switch to be copied: pressing once switches the output on, pressing a second time switches it off.

By selecting the "Intruderalarm" option the activated alarm system will include the contact during monitoring. Then, as soon as the toggle switch is operated, the intruder alarm system triggers the alarm signal.

Parameters

Parameters	Description
Toggle switch	
Use in Intruder alarm	If this function is ticked, a configured intruder alarm system will include the input in the monitoring. This means that when the alarm system is switched on the alarm signal will be triggered if the input has been activated.

Timing Characteristics



The first pulse of the input enables the output; the second pulse disables it again.

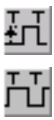
Example of an Application

Task: A light is to be switched on with a touch contact switch.

Solution: Use e.g. the DSS 2U flush-mounted operating signal module for the input of the operating signal and configure one input with address A1. An output of a relay module (e.g. DSM 8) is assigned the same address. Then all that is required is to configure channel A1 in ProLine as a toggle switch function.

Object	Significance	Channel	Notes / Configuration
Input/Output			
Relay output	Light	A1	Modules DSM 1U/DSM 2/DSM 4E,R/DSM 8
Push-button input	Light contact switch	A1	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
ProLine Configuration			
Toggle switch	Lighting control	A1	

4.2.4 Timer / Recycler



- Function: Timer (timing element) or recycler (pulse generator)
- Application: Switching loads with on- or off-delay or pulsing.
- Activated by an activated signal or an operating pulse.
- Activated by additional channel or marker.
- Insertion either with mouse ("Timer") or shortcut key "T".

Description

This object offers the choice between two operating modes: as timer and as recycler. With both modes the functions are started by an input which has been coded for the timer channel; but it is also possible to use another channel or a marker for activation.

Timer (On/Off delay)

The timer can be set for delayed switching on and/or off (Off Time). During the switching-on delay the output signal remains disabled and is only activated when the off time begins.

Via the "Pulses by Activation" option its behaviour can be adapted to the input signal. If this option is switched off, then the input signal has to be present at least until the on-delay has elapsed; after which the channel generator activates the output. Only when the input signal is withdrawn will the off time start.

When the "Pulses by Activation" option is activated the input signal does **not** need to be operative during the whole of the delay time. Here, the off time starts automatically when the on-delay has elapsed. In the case of an input signal which persists longer than the on-delay, the off time will only start after withdrawal of the input signal.

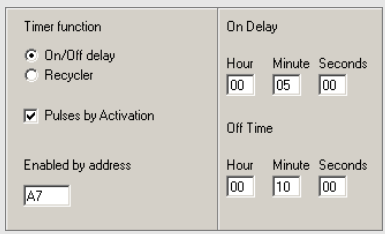
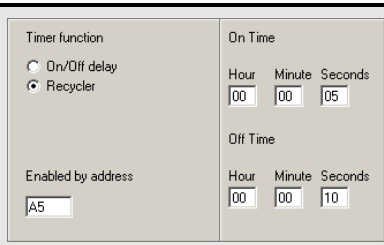
This setting is particularly important if a master control command is to start the timer, as this command is usually of only a short duration.

Recycler

If the recycler is started via an input, it generates a repeating square wave signal. The output will be activated according to the "On Time" setting and then switched off again according to the "Off Time" setting. This process is repeated for as long as the signal of the input or the additional triggering address is present.

Parameters

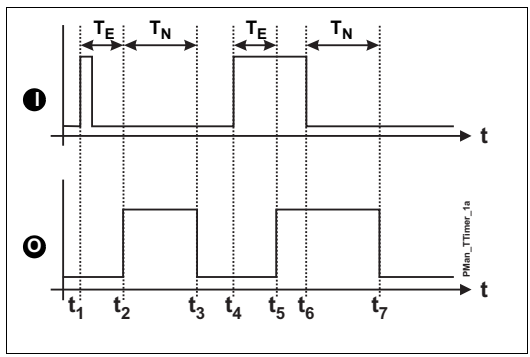
Depending upon the selection in the "Timer function" field, different parameters will appear for timer and recycler:

Parameters	Description
Timer (On/Off delay)	
Timer function	To use the timer select here the "On/Off delay" mode.
Pulses by Activation	Select this option to start the timer with a short pulse e.g. by pressing a push-button.
On Delay	Here you can enter the time (0 s to 99 h, 59 min, 59 s), which is to elapse **before** the channel is activated.
Off Delay	Here you can enter the extension time (0 s to 99 h, 59 min, 59 s) during which the channel is to be activated.
Enabled by address	In addition, the channel or marker entered here can also start the timer. Its behaviour is the same as that of the input channel; the setting "Pulses by Activation" is also effective here. To prevent self-latching of the signal, the timer's own address may not be entered here.
Recycler	
Timer function	To use the recycler select here "Recycler" mode.
On Time	The setting selected here (1 s to 99 h, 59 min, 59 s) determines the time during which the output is switched **on** during pulsing.
Off Time	The setting selected here (1 s to 99 h, 59 min, 59 s) determines the time during which the output is switched **off** during pulsing.
Enabled by address	In addition, the channel or marker entered here can also start the timer. To prevent self-latching of the signal, the timer's own address must not be entered here.

Timing Characteristics

Timer (On/Off delay)

The following timing is based on the assumption that the "Pulses by Activation" option has been selected:



t_1: By activating this input (operating pulse) the on-delay T_E will start.

t_2: After the on-delay has elapsed, the off time T_N starts at which point the output is switched on.

t_3: At the end of the off time the channel generator will also disable the output.

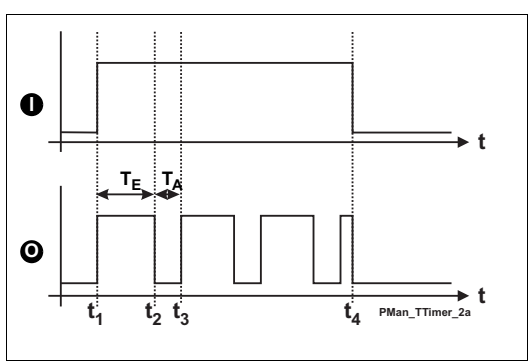
t_4: Here, too, the output is reactivated and the on-delay T_E starts.

t_5: After the on-delay has elapsed, the output is activated. However, the off time does not commence here.

t_6: Only when the input is again inactive will the measuring of the off time T_N begin.

t_7: At the end of the off time T_N the DKG disables the output again; but only if the input had previously been deactivated.

Recycler



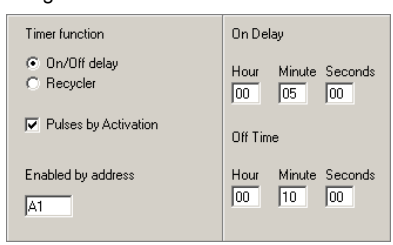
The generation of the pulse starts shortly after the input is activated at time t_1. The pulse cycle then consists of the ON time T_E and the OFF time T_A. Deactivation of the input also terminates the pulse generation (t_4).

Example of an Application

Task: A ventilator in a toilet is to start 5 min after the light is switched on and to run for 10 min.

Solution: The lighting is operated via a push-button, which is connected to an operating signal sensor (e.g. the DSS 2U flush-mounted input module) and which is configured as a toggle switch function at address A1. The output of a relay module (e.g. DSM 8) is assigned the same address and controls the lighting.
A second channel, A2, is configured as a timer and is controlled via the above mentioned push-button. Another channel of the DSM 8 output module is also assigned this A2 address and controls the ventilator.

File: *timer.dkg*

Object	Significance	Channel	Notes / Configuration
Input/Output			
Relay output	Toilet light	A1	Modules DSM 1U/DSM 2/DSM 4E,R/DSM 8
Push-button input	Light switch	A1	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
Relay output	Toilet ventilator	A2	Modules DSM 1U/DSM 2/DSM 4E,R/DSM 8
ProLine Configuration			
Toggle switch	Lighting control	A1	
Timer	Ventilator control	A2	Configuration: 

By utilising the additional trigger ("Enabled by address") of A1 the timer will start when the light is switched on.

4.2.5 Real-Time (Clock)

- Function: Timing for four switching times with 7-day programme and holiday set-up.
- Application: Time-controlled switching on and off of loads.
- Can also double as toggle switch function.
- Central definition of holiday settings for all time switches.
- Insertion either with mouse ("Real-time") or shortcut key "R".

Description

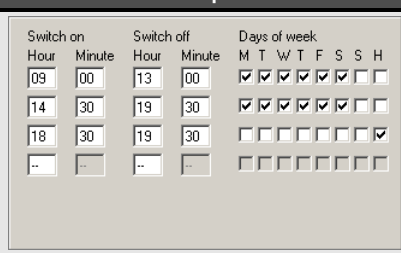
The real-time function permits loads to be switched on and off depending upon the internal clock of the channel generator. For each real-time function up to four on- and off-times can be programmed; these to be executed at freely selectable days of the week and holiday dates.

Tip: If you wish to switch on and off on different days, simply leave blank those on and off times which are not required (see example).

The real-time option is based on the toggle switch function; it is thus also possible to carry out manual switching processes with standard inputs during time-controlled operation.

Note: If you are exporting the ProLine file to the channel generator at a point in time which lies between the on and off switching times of time switch, the channel of the time switch function will always be activated. This also applies when the channel generator is switched on.

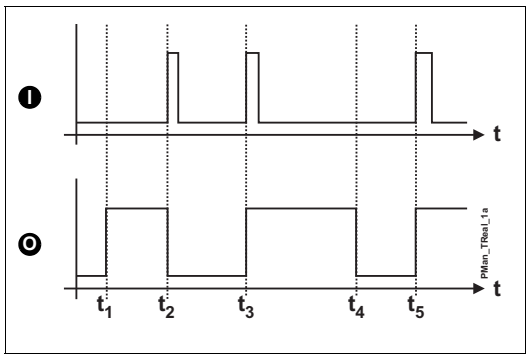
Parameters

Parameters	Description
Real-time	
Switch on	Time at which the channel is to be switched **on** (00:00 to 23:59).
Switch off	Time at which the channel is to be switched **off** (00:00 to 23:59).
Days of week	Day(s) on which the switching time on the left has to be executed (M: Monday, T: Tuesday, W: Wednesday, T: Thursday, F: Friday, S: Saturday, S: Sunday). If "H" has been ticked, the clock will switch at every entered holiday date irrespective of the specified days of the week. Holiday dates are entered in the ***<Edit><Holiday Set-up>*** menu. For details see **Chapter 3.7.2 "Holiday Set-up"** on **Page 16**.

Timing Characteristics

The following diagram illustrates the timing process, with I being an optional input channel at the address

of the real-time function:



t_1: The time switch activates the channel at the preconfigured time without being influenced by the input channel.

t_2: Upon actuation of the input the output switches directly off.

t_3: Renewed actuation of the input switches the output on again.

t_4: At the selected switch-on time the output will in any case be deactivated.

t_5: The output can be reactivated at any time via the input.

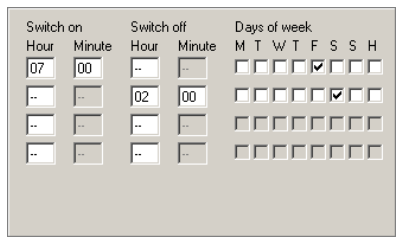
Example of an Application

Task: The lighting in a basement is to be switched on automatically every Friday at 7 o'clock and to be switched off at 2 o'clock the following day. On all other days it can be switched on and off manually with a push-button.

Solution: Use e.g. the DSS 2U flush-mounted operating signal module for the input of the operating signal and configure one input with the address A1. An output of a relay module (e.g. DSM 8) is assigned the same address. Then all that is required is to configure channel A1 in ProLine as a toggle switch function.

File: *real-time.dkg*

Object	Significance	Channel	Notes / Configuration
Input/Output			
Relay output	Shop-window	A1	Modules DSM 1U/DSM 2/DSM 4E,R/DSM 8
Push-button input	Light switch	A1	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8

Object	Significance	Channel	Notes / Configuration
ProLine Configuration			
Real-time	Time control	A1	Configuration of Real-Time Clock: 

4.2.6 The Master Function

- Function: Central enabling and disabling of toggle switches, real-time switches etc.
- Integrated real-time switch with four switch times
- Application: Centrally switching of loads on and off, retrieving lighting scenes of dimmer switches.
- Insertion either with mouse ("Master function") or shortcut key "M".

Description

The master function enables simultaneous activation of any number of channels which have been configured with suitable objects.

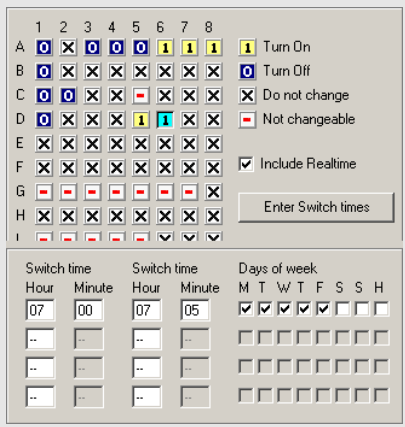
When activating the master function an On-signal is generated for a time span of 2 cycles at those channels which have been marked for switch on, while at channels marked for switch off a corresponding Off-signal is generated. The objects configured at these channels then determine the behaviour of the outputs.

Attention: Please note the following points when using the master function:

- At the moment of activation the master function has priority before individual control commands, i.e. operating an individual channel is not possible, as long as the master command is active. When this master command is withdrawn, any decentral commands will again be accepted.
- Particularly in connection with real-time switches, it should be noted that only one master function command can be carried out at one and the same time. In the case of simultaneous activation of several master commands only the one with the highest address number (e.g. B7 before A5) will be executed.
- The master function cannot affect any channels with priority functions, such as e.g. alarm channels or analog sensors.
- A master function cannot activate another master function.

Parameters

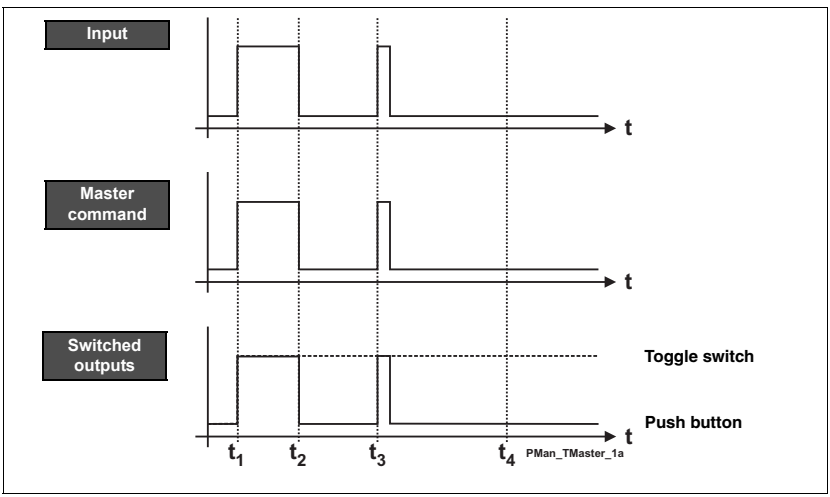
The object has the following configuration page when the real-time function has been included and the ***<Enter Switch times>*** button has been activated:

Parameters	Description
Master function	
Address matrix	Mark here with a "1" those addresses which are to be switched on when the master command is being executed, and mark those which are to be switched off with an "0". Addresses bearing an "X" remain untouched. Any addresses which are automatically marked with a red dash "-", cannot be centrally controlled. These are e.g. master functions, roller-blind controls etc.
Include Realtime	When this is activated, a real-time function will be included which carries out the master command according to time control settings. The ***<Enter Switch times>*** field will appear.
Enter Switch times	Click this field in order to activate the real-time function for the input and to deactivate it again afterwards.
Real-time	The real-time function for the time-controlled operation of the master command operates in the same way as the "Real-time" object. For further details see **Chapter 4.2.5 "Real-Time (Clock)"** on **Page 36**. In contrast to a separate time switch, the real-time function only generates switch pulses. This should be noted in particular if the master command is to switch outputs which have been configured as "Push button". These could possibly then receive only a short switch signal.

Tip: Complete address groups can be changed to the relevant group by clicking with the right mouse button.

Timing Characteristics

The following diagram illustrates the correlation between the input of the master command, the master command itself and the switched-on outputs (in this example: continuous line: a push button function, dotted line: a toggle switch function).



The master command remains active until the input is deactivated. The outputs are switched on - in this example - with the push-button; however, this is only the case until the master command ceases again.

Example of an Application

Task: In a domestic building master functions are to be used for 4 lights and 2 dimmer switches:

- Master ON: Switches all the lights on and sets the DDM 1***plus*** dimmer to 100%.
- Master OFF: Switches all the lights off and sets the DDM 1***plus*** dimmers to 0%.
- Lighting scene for lounge: Lighting scene 6 (factory setting 85%) is to be called up at both DDM 1***plus*** dimmers.

Solution: Configure three push-buttons for the central and lighting scene retrieval as master function commands at addresses A1 to A3. The channels of the dimmers are coded B1 to B8 and configured as toggle switch functions.

File: *lightscene_via_master_function.dkg*

Object	Significance	Channel	Notes / Configuration
Input/Output			
Push-button input	Master ON	A1	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
Push-button input	Master OFF	A2	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
Push-button input	Push-button to call-up lighting scene 6	A3	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8

Object	Significance	Channel	Notes / Configuration
Dimmer channels	Channels to call-up lighting scenes	B1..B4 B5..B8	Module DDM 1***plus***
Relay outputs	Lights	C1..C4	Modules DSM 1U/DSM 2/DSM 4E,R/DSM 8
ProLine Configuration			
Master function	Master ON channel	A1	On-command for lights C1..C4; Retrieval of lighting scene 2 (factory setting 100%) at both DDM 1***plus*** (channel 4, B1/B5);
Master function	Master OFF channel	A2	Off-command for lights C1..C4; **On**-command of master OFF channel at both DDM 1***plus*** (channel 1, B1/B5);
Master function	Lighting scene retrieval	A3	Simultaneous activation of channels B1, B3 and B4 for retrieval of lighting scene 6. Off-command for lounge wall light C2.
Push button	Dimmer channels 1..4	B1..B4 B5..B8	Channels of DDM 1***plus*** dimmer(s): 1: B1, 2: B2, 3: B3, 4: B4.
Toggle switch	Lights	C1..C4	Manual switching of lights

4.3 Special Objects

4.3.1 Analog Sensors

- Function: Transfer of analog data (temperature, light level, wind and other sensors) and their evaluation for switching processes.
- Application: Display of analog (AnaLink) data on text display / touch screen; switching loads (e.g. radiators, lights, roller blinds) in accordance with e.g. temperature or outside lighting.
- Evaluation as frequently as required of an analog value in relation to other inputs.
- Up to two switching ranges defineable per channel.
- Suppression (disabling) of switching processes by other channels or markers.
- Insertion with mouse ("Analog Sensor").

Description

The objects of the analog sensors provide the option of integrating analog measuring devices (transfer by AnaLink process) into the Dupline system and of further processing their data. In all, there are four sensor types which can be selected in the object window under the "Function" header:

Measuring Device: 

This is the general sensor object: With this all sensor types can be integrated (all other following sensors, such as e.g. the light level sensor, only make different icons available and, in some instances, already present the sensor input range).
As all sensors operate in the same manner, the functions are explained with the aid of the general measuring device.

Light Sensor: 

This predefined object for the DLUX light level sensor acts like the measuring device but features a different icon and the preset measuring range of 0.1 to 100.000 lux.

Wind Sensor: 

This sensor object is designed for the integration of an air speed meter (anemometer). But because Doepke's wind sensor SIWS can only be operated with the SIWR wind relay, wind sensors with analog outputs from other manufacturers have to be used for this application. That consideration apart, this object functions like the measuring device.

Temperature Sensor: 

This object also operates like the measuring device, but has its own icon to aid identification. Temperature sensors, such as e.g. the DTS 1 and DTS 2 should preferably be used in connection with this object.

General:

The data transfer via one sensor channel generally takes place by the AnaLink process (see [1]). The accuracy is 8 bit (in the case of the wind sensor 5 bit are analysed - in order to increase the reaction rate).

Analog transfer channels do not function like normal switching channels; e.g. they cannot be switched with push-buttons which are operated on the same channel. This means that another (possibly virtual) channel is required if, for example, a sensor is to be switched only at a certain time and, in addition, is to be switched manually.

Furthermore, analog data cannot be processed by means of markers. Instead there is the possibility of

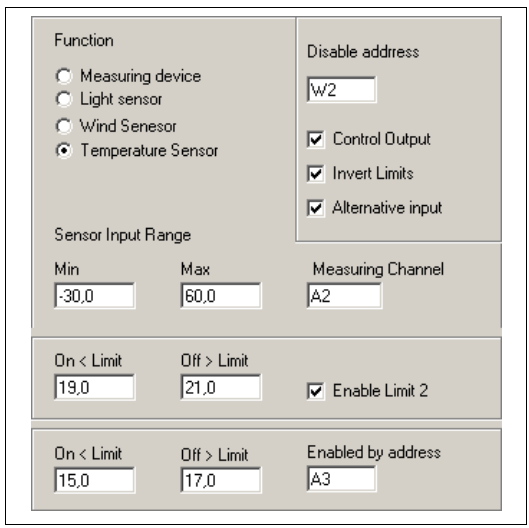
configuring several analog sensors in such a way that they access a 'source value'.

Working with the DTG 1 Tester

Data transferred by the AnaLink process cannot be displayed with the DTG 1. But by setting the channel for a longer time it is possible to affect the AnaLink data. If you have already coded an analog sensor at this channel, a summation of the input signals will result.

Parameters

The object has the following configuration page:



Generally speaking, the operating mode of the sensor depends upon what is then to be done with the data:

You want to display analog data on a PC, touch screen or text display:

For the purpose of display in this case you require a 'pure' analog value. To achieve this you have to code the analog sensor object on the channel of the sensor; but the "Control Output" and "Alternative input" parameters may **not** then be activated.

Note: It is possible to set limits in this operating mode. Even without the "Control Output" having been activated you can utilize the switch commands of this channel as an input in logic connectives.
In this case the sensor input range should be configured with a minimum and maximum limit (e.g. for the DTS 1 -30ºC and +60ºC).

You want to control an electrical load, or similar, with the aid of the sensor:

For this the "Control Output" parameter has to be activated so that the limits, which have then to be set, can be evaluated. The result of such evaluation is that on this channel a switch command is generated for outputs (relays or similar) with the same address. Configure the sensor as follows:

1. Enter the input range of the sensor (this will be marked on the sensor itself or specified in the operating instructions): the DTS 1 and DTS 2 temperature sensors, for example, measure temperatures between -30ºC and +60ºC.

2. Enter the operating range at which the object is to switch on or off: you will then get the threshold values "Off < Limit" and "On > Limit". This means that the channel is switched off when the analog value falls below the first entry and that the channel is switched on when it exceeds the second figure.
   More often - and in particular in the context of heating controls - you will want to switch the radiator on when its temperature falls below the setting, and to switch it off when it exceeds it. The necessary reversal of the evaluation is accomplished by the "Invert Limits" parameter; this changes the meaning of the entered values to "On <Limit" and "Off > Limit". Select the values shown in order to control the temperature of a room between 19ºC and 21ºC.

You want to use other limits under certain conditions:

In order to configure the heating for e.g. night-time reduction, proceed via the following steps:

1. Carry out steps 1 and 2 above.
2. Activate the "Enable Limit 2" option and enter the limits.
3. In the "Enabled by address" box enter an address of a marker which activates these two limit values. This can be e.g. the address A3, as shown in the illustration, at which a real-time clock has been configured

Note: The second pair of limits will also be affected by the "Invert Limits" option.

You want to disable switching processes under certain conditions:

1. Carry out the configuration as described above.
2. In the "Disable address" box enter an address of a marker at which, when activated, the evaluation of the sensor will be suppressed. The switching channel will thus neither be switched on nor switched off.

You want multiple evaluation of the sensor:

1. Configure an analog sensor as 'source', i.e. not as a switching channel. The sensor itself must also be coded at this address, i.e. for example a DLUX channel.
2. Set up as many sensor objects as required of the type in question and configure them as described in the previous steps.
3. In each object set-up use the 'source object' of step 1 as reference. This is accomplished by clicking the "Alternative input" box and entering the address of step 1.

The following table again lists all parameters:

Parameters	Description
Function	Select here whether you want to operate a general measuring device, a wind sensor or a temperature sensor. Basically, all function in the same way.
Disable address	A channel, or marker, entered here and activated will result in all switching processes of the sensor being suppressed. The figure can be overtyped at any time and erased with the **Del** key.
Control Output	This is an essential entry if the sensor is to switch e.g. a relay which has been coded with the same address. This setting should not be activated if you want to display the analog data of the sensor (e.g. on a touch screen panel).
Invert Limits	With this setting you invert the switching conditions for both sets of limit values. Thus, instead of "On > Limit" you will get the setting "Off > Limit".
Alternative input	Here you determine whether the analog value for this sensor object originates from another channel. If this box is ticked you can define a channel in the "Measuring Channel" box from which the actual value is to be drawn. This setting should not be activated if you want to display the analog data of this channel (e.g. on a touch screen panel).

Parameters	Description
Sensor Input Range	Here the upper and lower measuring data of the sensor should be specified. For the DTS 1 temperature sensor this would be "-30ºC" as the lower value and "60ºC" as the upper value. You must confirm each entry by pressing **ENTER** otherwise the entries will not be stored.
Measuring Channel	If the sensor, which provides the data, has been coded on another channel, the "Source Channel" can be specified here. But to be able to do so, the "Alternative input" must first be activated. The entry can be overwritten at any time and erased with the **Del** key.
Off < Limit On > Limit or On < Limits Off > Limits	These are the switching limits of the sensor object. If the "Invert Limits" box has been activated, the upper conditions will be displayed. If you enter the values "17.0" and "20.0" the channel will switch off below 17.0 and switch on above 20.0. If you have inverted while retaining the same values, the sensor will switch the channel on below 17.0 and off above 20.0, which would be a typical setting for a heating control. These limits are only active provided the "Enabled by address" trigger of an existing second limit has not been switched on.
Enable Limit 2	With this option you activate the input of a second set of limits with which e.g. a night-time reduction can be set up.
Off < Limit On > Limit or On < Limits Off > Limits	The second limit gives you the option of defining - via the "Enabled by address" parameter - a different switching behaviour. If the other triggering address is activated, the object will ignore the first set of limits. This set of limits is also controlled via the "Invert Limits" box, i.e. evaluation will then be reversed. You must confirm each entry by pressing **ENTER** otherwise the entries will not be stored.
Enabled by address	If the channel, or marker, entered here is not active, the first set of limits will be used for the evaluation; if it is active the second pair will be used. The entry can be overwritten at any time and erased with the **Del** key.

Timing Characteristics

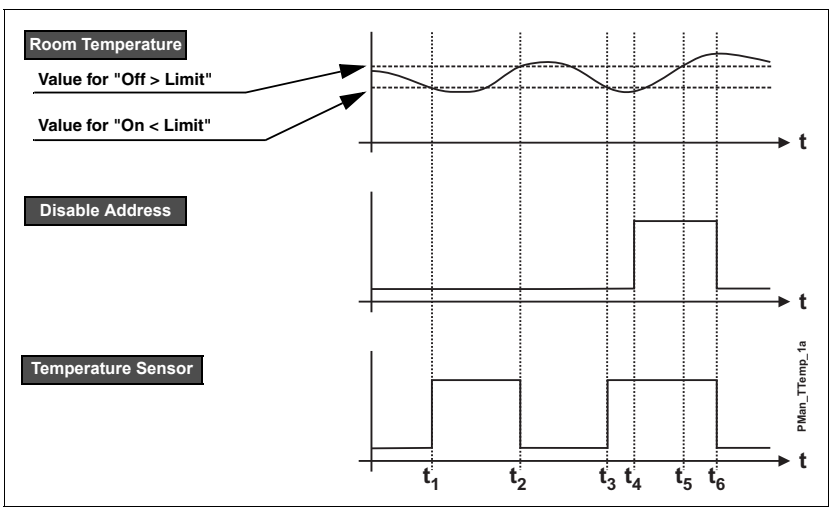
Sensor for displaying the measured value:

In this case the displayed sensor data will lag slightly behind the true value.

Note: After switching on the sensor, or the Dupline bus, the true sensor data will be reached only after approx. 30 seconds. The system needs this time in order to fully transmit the figure.

Sensor as switching channel:

The timing characteristics of the sensors are illustrated below using a temperature sensor as an example; the upper graph curve represents the room temperature, the middle one the disable address and the bottom curve the temperature sensor as the switching channel.



t_1: The temperature in the room sinks below the figure which has been entered for "On > Limit", e.g. 21ºC. Because the disable address is "0", the "Temperature Sensor" object switches the channel on.

t_2: The temperature reaches the setting for "Off < Limit", e.g. 17ºC. Here, too, the disable address is "0" so that the channel of the "Temperature Sensor" object switches off.

t_3: The temperature of the room again reaches the lower limit, the object switches on.

t_4: The disable address (channel or marker in the "Disable address" box) is now activated by e.g. a change-over switch.

t_5: Despite reaching the upper limit the object does not switch the channel on, because the disable address has been activated.

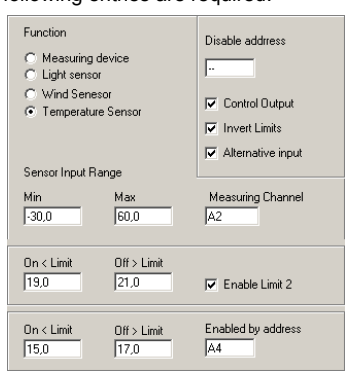
t_6: Not until the disable address has been deactivated does the temperature sensor's switching channel switch off again.

Example of an Application

Task: A radiator is to keep the room temperature between 19ºC and 21ºC during the day. At night the temperature is to be lowered by 4ºC.
The DTS 2 temperature sensor in this room is coded at address A2 and serves to display the temperature on a DSC 3 touch screen.

Solution: Because the analog value of the sensor at A2 is already required for the display, the temperature object - and the relay which controls the radiator valve - is assigned address A3. For the night-time reduction we use a real-time function at A4 with the appropriate switch times; it serves as an "Enabled by address" trigger for activating the second set of limits.

File: *temperaturecontrol.dkg*

Object	Significance	Channel	Notes / Configuration
Input/Output			
Temperature sensor	Temperature	A2	Modules DTS 1, DTS 2, industry modules
Relay output	Radiator valve	A3	Modules DSM 1U/DSM 2/DSM 4E,R/DSM 8
ProLine Configuration			
Analog Sensor: Temperature Sensor	Analog data transfer	A2	Makes analog data available for touch screen a Temperature Sensor and serves as source for the sensor object at channel A3. "Control Output" must not have been activated here.
Analog Sensor: Temperature Sensor	Evaluation of the analog signal and switching channel for the relay of the radiator valve	A3	The following entries are required: 
Real-time (clock)	Time switch for the night-time reduction	A4	A sensible time should be entered here, e.g. from 23.00 hours to 6.00 hours. During this time the "Temperature Sensor" object uses the second set of limits.

4.3.2 Motion Detector

- Function: Inclusion of proximity detectors or similar input devices in the Dupline system.
- Application: Controlling lights and integration into the intruder alarm system.
- Off Time selectable from 00 h 00 min 00 s to 99 h 59 min 59 s.
- Variable number of movement pulses offers better safeguard against false alarms by the intruder alarm.
- Insertion with mouse ("Motion Detector").

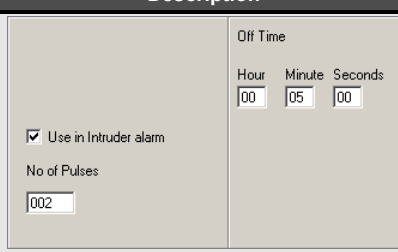
Description

The "Motion Detector" object permits the inclusion of Dupline proximity detectors (e.g. DBM 1) and standard motion detectors, which are connected to the Dupline bus via binary inputs.

The motion detector thus connected can be programmed with an extension time (Off Time) and be integrated into the intruder alarm system. To reduce the number of false alarms, the number of pulses required within 10 s can be preset, at which the alarm will be triggered.

Note: If you want to use a proximity/motion detector which automatically generates an extension time, we recommend you use the "Push button" function.
The DBM 1 is also provided with an extension time, but this can be disabled with a DIP switch.

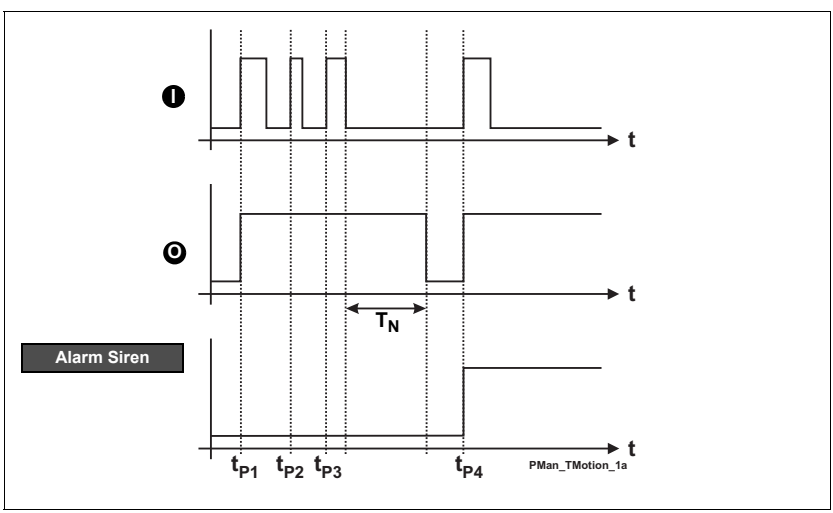
Parameters

Parameters	Description
Motion Detector	
Off Time	The time during which the channel is to remain active (00:00:00 to 99:59:59) after a movement pulse has been registered. Further pulses will always start the off time anew. If an Off Time of 00:00:00 is entered, the channel generator emits a short output pulse irrespective of the duration of the input pulse.
Intruder Alarm	Tick this checkbox to include the channel in the monitoring of the intruder alarm system. Switching the intruder alarm system live is then carried out with its enable function (see **Chapter 4.4.5 "Intruder Alarm"** on **Page 64**).

Parameters	Description
No of Pulses	The figure entered here (1...255) determines how many pulses the motion detector may generate within 10 s until an alarm is triggered. When a pulse is detected the channel generator checks whether the number of pulses during the preceding 10 s exceeds the preset number. Should that be the case, then an alarm signal will be generated provided the intruder alarm is active. This setting therefore provides a better safeguard against spurious false alarms. ***Note:*** Because the evaluation takes place afterwards, an additional pulse is required each time. This means that when the preset number is "3", the alarm will not be triggered until the fourth pulse. The Off Time as set does not affect the alarm signal being generated.

Timing Characteristics

In the following illustration "I" represents the input channel of the motion detector, or the contact, and "O" the output signal of the same channel. Also, the "Motion Detector" object has been integrated into the intruder alarm system, whose alarm siren can be seen in the bottom diagram. The number of pulses selected was "3":



t_{P1}, t_{P2}, t_{P3} and t_{P4} are the times when the motion detector generates a signal; the duration of the pulse depends upon the characteristics of the detector. T_N is the setting for the Off Time, which is post-triggered by the pulses t_{P2} and t_{P3} and therefore does not start until after the third pulse has passed.

The alarm is not triggered until the fourth pulse t_{P4} occurs, if the time span between t_{P1} and t_{P4} is less than 10 s.

Example of an Application

Task: The lighting in a hall is to be switched on automatically for 5 minutes by the DBM 1 proximity detector and is also to serve - during absences - as an intruder detector.

Solution: The DBM 1 needs only to be connected to the Dupline bus wire and assigned an address (here: A1). In this case disable the extension of the signal transmission time with the DIP switch. Configure the "Motion Detector" object as well as an output channel of a relay module (e.g. DSM 8) for address A1 and configure any other required objects for the intruder alarm (Manual armouring, Alarm siren).

File: *motiondetector.dkg*

Object	Significance	Channel	Notes / Configuration
Input/Output			
Proximity detector	Alarm signal	A1	DBM 1 (direct) or other manufacturers' modules via DSS 2U/DSS 4U/DSS 8U/ DSU 2U/DSU 8
Relay output	Hall lighting	A1	Modules DSM 1U/DSM 2/DSM 4E,R/DSM 8
Push-button input	Enabling alarm	A2	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
Relay output	Alarm siren	A3	Modules DSM 1U/DSM 2/DSM 4E,R/DSM 8
ProLine Configuration			
Motion Detector	Light and alarm control	A1	Configure the motion detector as given under "Parameters".
Intruderalarm	Enabling the alarm system	A2	Configure the delay according to environmental alarm system conditions.
Alarm siren	Alarm signal	A3	Configure the alarm signal time and the type of alarming (e.g. pulsing on several channels) according to your application.

Here, too, the proximity detector directly activates the output module for the lighting at address A1. If the alarm system is activated via the manual enable push-button, the channel generator will trigger an alarm within 10 s of the third pulse.

For further details on the intruder alarm refer to **Chapter 4.4.5 "Intruder Alarm"** on **Page 64**.

Tip: If you want to use the sabotage safeguard (inverted function) of the DBM 1, you should configure the "Push button" option with the setting "Inverted function" and utilize the extension of the signal transmission at the device.
In order to include the detector with sabotage safeguard in an intruder alarm, you have to use the "Active detector" object of the intruder alarm system

4.4 Alarm Systems

4.4.1 Overview

This chapter is intended to enable you to use the four different Dupline alarm systems. These are:

1. ISA Alarm (**Chapter 4.4.3** on **Page 53**)
   This general alarm system was developed to ISA specifications; it can be flexibly employed and serves as a pattern for the other alarm systems. Possible applications are, amongst others, for temperature and fluid level monitoring, and in installations which require general alarm functions.
2. Smoke Alarm (**Chapter 4.4.4** on **Page 59**)
   This alarm system is used mainly in connection with the Dupline DRD 2 smoke alarm. It is, of course, also possible to use other smoke alarms which provide either a normally-closed or normally-open-contact. In that case the link to the Dupline system can be established via a binary input.
3. Intruder Alarm (**Chapter 4.4.5** on **Page 64**)
   This system makes objects available with which the input signals for the intruder alarm can be monitored. These may be electrically isolated or potential-bonded contacts, which are linked to the system via binary Dupline inputs.
4. Water Alarm (**Chapter 4.4.6** on **Page 71**)
   The water alarm has been introduced as a separate system - it is intended for use in connection with water-stop sensors.

The alarm systems differ

- in their enable mechanism (manual armouring/armouring switch)
- in the way the alarm is reset (acknowledge/reset)
- in the type of alarming, and
- in the timing characteristics.

The individual systems are explained in detail in the following pages. It is possible to use the "Common siren" object (**Chapter 4.4.7** on **Page 76**) for all systems, which enables a collective alarm signal.

4.4.2 General Characteristics

4.4.2.1 Input/Output on one Channel

The alarm systems in particular benefit from the ability of the Dupline system to distinguish between inputs and outputs on the same channel ("Split I/O"). It is thus possible to use a normally-open-contact for resetting the system and thereafter to pulse it on and off.

- You should therefore not be surprised if
- a channel is activated without an input having been actuated, or
- a channel is not activated when an input has been actuated.

4.4.2.2 Master Functions

In general, alarm objects cannot be influenced by master functions.

4.4.3 ISA Alarm

	• Function: General alarm system with inclusion of active/passive detectors, acknowledge button, standard reset, lamp test facility and alarm siren. • Application: Monitoring of contacts and other alarm sources. • Insertion either with mouse ("ISA alarm") or shortcut key "A".

Description

The ISA alarm is designed for setting up a general alarm system to ISA specifications. The system supports two operating modes:

1. **Standard reset**: resetting of an alarm ("Reset") and reactivating is carried out manually via a push-button.
2. **Auto Reset**: both the resetting of an alarm and the reactivation of the system takes place automatically after acknowledgement and remedying the cause of the alarm (normal position of the signal contacts).

Signal contacts are generally included in the system via the "Passive detector" and "Active detector" objects. The alarm system is initially switched live after downloading the ProLine application, when all signal contacts are in their idle position, or by pressing the reset button. The alarm is triggered when one or more signal contacts are activated. The system then flashes the activated signal contact approx. every second and switches the alarm output on for the selected time span.

After actuating the acknowledge button in the **"Reset" mode** the signal contacts switch from blinking to continuous operation and the alarm output is switched off. At this point a renewed activation of a signal contact no longer triggers an alarm. Subsequent actuation of the standard reset button switches the signal contact off and enables the alarm system again.

If the standard reset is actuated **before** the acknowledge button, the system will also switch off the alarm output; however, the signal contacts will continue to flash. In this case a renewed activation of a signal contact will trigger a new alarm.

In the **"Auto Reset" mode** the alarm system will be restarted after an acknowledgement and with the signal contacts in idle position.

The status of the signal contacts can easily be displayed, e.g. on an indicator board. All that is required is that the output channels are coded with the addresses of the signal contacts. The functioning of the lamps can be ascertained with the "Lamptest" object.

The "Common Siren" can also be used for the alarm signal. For details see **Chapter 4.4.7 "Alarm Siren / Common Siren"** on **Page 76**.

Various ISA objects can be selected via the "Channel function" dialogue entry:

Passive Detector:  With this object you can incorporate normally-open-contacts (passive detectors). If a contact is tripped, and thereby a "1" signal is transmitted on the bus, the alarm will be raised.

Active Detector:  With this object you can incorporate normally-closed-contacts (active detectors). If a contact is tripped, and thereby a "0" signal is transmitted on the bus, the alarm will be raised.

Acknowledge: 

With this object you can incorporate acknowledgement buttons. By actuating the acknowledgement the alarm output will be reset and the alarm source indicator prepared for reset (change-over from flashing to continuous signal).

Note:
This object must be configured in every case.

Reset: 

This object is only required in the "Standard" reset mode and enables the inclusion of a push-button for resetting the alarm and restarting the system. However, the alarm has first to be acknowledged.
If a contact is activated while resetting a channel, the system will set off a new alarm.
When you are configuring this object, ProLine will automatically select the "Standard" mode.

Lamptest: 

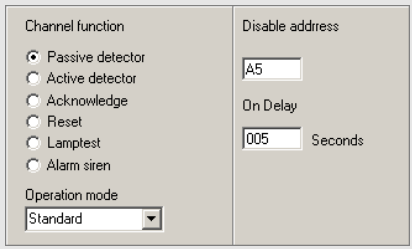
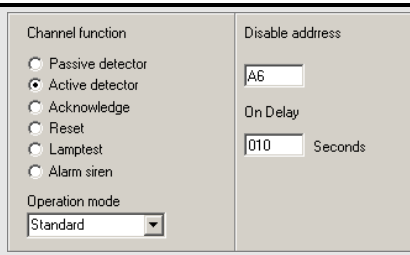
This object allows you to check the functioning of the lamps, which indicate the status of the signal contacts. When actuating the lamp test button all signal channels will be activated.

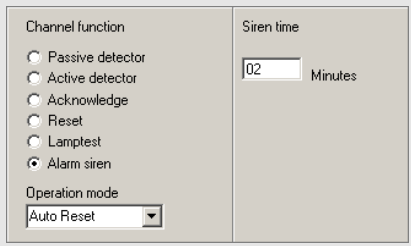
Alarm Siren: 

The alarm siren indicates whether an alarm situation has arisen. The channel configured with this object can be used to output the alarm at any output modules. It normally activates a relay output which, in turn, is connected to a siren.

Parameters

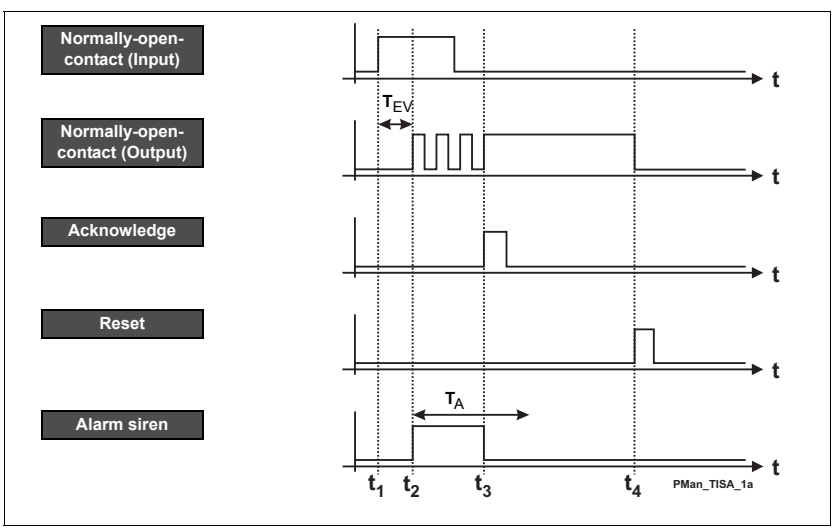
Parameters	Description
Operation Mode	
	Standard Reset With this setting you determine that the activation of the alarm system takes place after prior release of the reset button. This means, of course, that the "Reset" object has to be configured. **Auto Reset** With this setting the system is automatically activated after an acknowledgement, when all normally-closed and normally-open contacts are in their "normal" position (in which they do not trigger an alarm). ***Note:*** You can select the operating mode at any of the ISA alarm objects - but it will apply to the entire system. If the "Reset" object is set up so that a reset button is included, ProLine assumes that the "Standard" mode is to be adopted. At the same time the operating mode option will be deactivated. This can only be revoked by deleting the "Reset" object. If you select "Auto Reset", ProLine will prevent the configuration of the "Reset" object.

Parameters	Description
Passive detector	
Disable address	Enter here an address (A1..P8) or a marker (W1..Z8) upon whose activation ("1" signal) the normally-open-contact is to be excluded from the monitoring and is thus no longer able to trigger an alarm.
On Delay	Here you can enter the time in seconds (0..255) by which the alarm signal is to be delayed when the signal contact is activated.
Active Detector	
Disable address	Enter here an address (A1..P8) or a marker (W1..Z8) upon whose activation ("1" signal) the normally-closed-contact is to be excluded from the monitoring and is thus no longer able to trigger an alarm.
On Delay	Here you can enter the time in seconds (0..255) by which the alarm signal is to be delayed upon activation of the signal contact.
Acknowledge	
	There are no configuration options for this item.
Reset	
	There are no configuration options for this item.
Lamptest	
	There are no configuration options for this item.

Parameters	Description
Alarm siren	
Siren time	With this setting you determine for how long the alarm output is to remain activated when an alarm occurs. The setting can be between 0 and 60 min. A figure entered here will automatically be adopted by the common siren. ***Note:*** With the - (minus) key you can set an infinite time. This will be indicated by ">>>".

Timing Characteristics

"Standard" Mode:



This diagram illustrates the normal sequence of an alarm and its resetting in the "Standard" mode:

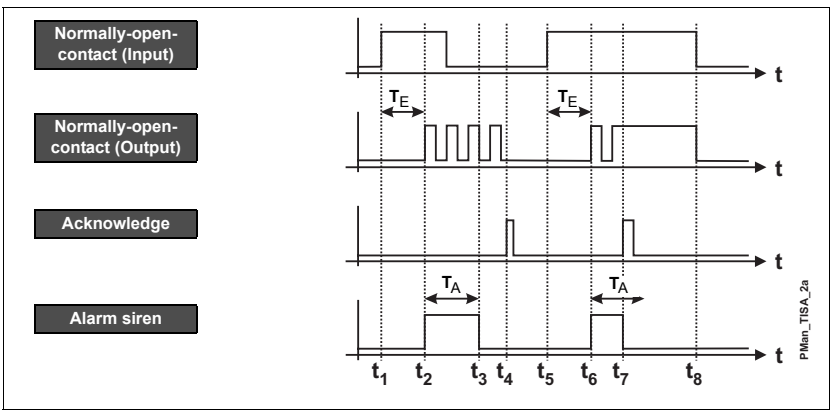
t_1: When all contacts are at idle, the channel generator automatically switches the alarm system live once the application is loaded.
If a contact is actuated thereafter, initially nothing will happen because of the entered On delay T_{EV}.

t_2: When the On delay T_{EV} has elapsed, the DKG activates the alarm siren and flashes the output of the source channel.

t_3: By pressing the acknowledge button the channel generator switches the alarm siren off (if the siren delay time has not yet elapsed) and changes the alarm source indicator to a continuous signal.

t_4: By pressing the reset button the alarm source indicator is also cancelled and the system restarted.

"Auto Reset" Mode



This diagram illustrates the normal sequence of an alarm and its resetting in the "Auto Reset" mode:

t_1: When all contacts are at idle, the channel generator automatically switches the alarm system live once the application is loaded.
If a contact is actuated thereafter, initially nothing will happen because of the entered on-delay T_{EV}.

t_2: When the on-delay T_{EV} has elapsed, the DKG activates the alarm siren and flashes the output of the source channel.

t_3: When the siren delay time T_A has elapsed, and the alarm contact has meanwhile been cancelled, the channel generator switches the alarm siren off.

t_4: With the acknowledgement the output of the normally-open-contact is deactivated and the system immediately and automatically switches back to live.

t_5/t_6: As per t_1/t_2.

t_7: Despite the alarm's having been acknowledged, the source indicator switches to continuous mode, as the alarm source is still active at this stage. As the siren time has not yet elapsed in this case, the alarm siren is switched off.

t_8: Only when the alarm source switches off, is the source indicator reset and the alarm system returned to live.

Example of an Application

Task: Eight laboratories in a chemical factory are to be fitted with alarm switches. When an alarm button is pressed, the works' fire brigade is to be notified via a siren. When the works' fire brigade has acknowledged the alarm, they are to proceed to the laboratory which raised the alarm.

Solution: The alarm switches are assigned to channels A1 to A8. The source of the alarm is displayed on an indicator board, whose LED is controlled via a DNP 8A output board of the indicator board. The addresses correspond to those of the alarm contacts. For acknowledgment the fire brigade centre is supplied with a push-button at address B1. The alarm is reset via a standard reset at address B2. The alarm is raised via a klaxon which is activated via a relay of a DSM 8 at address B4.

File: *alarmsystems.dkg*

Object	Significance	Channel	Notes / Configuration
Input/Output			
Alarm switch	Alarm contact	A1..A8	Modules DSS 2U/ DSS 4U/DSS 8U/DSU 2U/DSU 8
Push-button input	Acknowledgement	B1	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
Push-button input	Reset	B2	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
Push-button input	Lamp testing	B3	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
Semiconductor output	LEDs for source indication on indicator board	A1..A8	Modules DNP 8A, DPN/DNP 4 or DSM 1U/DSM 2/DSM 4E,R/DSM 8
Relay output	Alarm siren	B4	Modules DSM 1U/DSM 2/DSM 4E,R/DSM 8
ProLine Configuration			
ISA alarm: Passive detector	Alarm sources	A1..A8	On delay: 0 s
ISA alarm: Acknowledge	Acknowledgement of alarm	B1	-
ISA-Alarm: Reset	Reset the alarm	B2	-
ISA alarm: Lamptest	Activates all LEDS on indicator board	B3	-
ISA alarm: Alarm Siren	Audible alarm	B4	Siren time: 3 min

4.4.4 Smoke Alarm

	• Function: Fire detection system with inclusion of normally-closed/normally-open-contacts, reset button, alarm siren and alarm signal. • Application: Linking smoke/fire detectors, e.g. the DRD 2, into one alarm system. • Insertion either with mouse ("Smokealarm") or shortcut key "S".

Description

The smoke alarm serves to set up an alarm system consisting of smoke or fire detectors, which can be integrated as normally-closed or normally-open-contacts. By means of interlinking it is thus possible to replace conventional fire alarm systems.

Smoke detectors are always incorporated in the system via the "Passive detector" and "Active detector" objects. Upon downloading the ProLine application, or the channel generator being switched on, the alarm system is automatically switched live once the reset delay selected for the reset object has elapsed. During this time the reset output is switched on.

An alarm is triggered when one or more signal contacts are activated for a minimum of 3 s to 11 s[1]. The system then flashes both the activated signal contacts (as the alarm source indication), as well as the alarm output, approx. once every second. When the reset button is then pressed again the channel generator will cease to flash the alarm contacts and the alarm output. If channels then still remain activated, an alarm will be triggered after the reset delay has elapsed.

Note: In order to ensure proper functioning it is essential to configure the "Reset" object.

The status of the signal contacts can easily be displayed, e.g. on an indicator board. All that is required is that the output channels are coded with the addresses of the signal contacts.

By means of the momentary signal on its channel the "Alarm signal" object enables a telephone modem or GSM modem to be triggered.

The "Common siren" object may also be used for alarm purposes; for details refer to **Chapter 4.4.7 "Alarm Siren / Common Siren"** on **Page 76**.

Via the dialogue window "Channel function" various smoke alarm objects can be selected:

Passive Detector:  With this object you can incorporate smoke detectors with normally-open-contacts. If a contact is tripped, and thereby a "1" signal is transmitted on the bus, the alarm will be raised.

Active Detector:  With this object you can incorporate smoke detectors with normally-closed-contacts. If a contact is tripped, and thereby a "0" signal is transmitted on the bus, the alarm will be raised.

Reset:  This object enables the inclusion of a push-button for resetting the alarm and restarting the system.
If a contact is activated while resetting, the system will set off a new alarm once the reset delay has elapsed.
This object has to be configured in order to ensure the proper functioning of the fire alarm.

1. The activating time depends upon the number of channels set up - i.e. those in the basic set-up menu - and varies between 3 s (16 channels) and 11 s (128 channels).

Alarm Siren: 

The alarm siren indicates whether an alarm situation has arisen. The channel configured with this object can be used to output the alarm at any chosen output modules. It normally activates a relay output which, in turn, is connected to a siren.

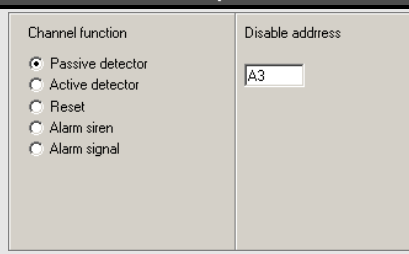
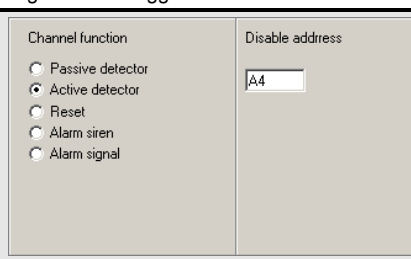
Note:
The alarm output signal is always flashed.

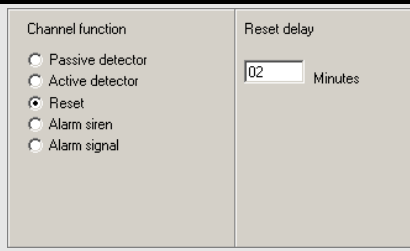
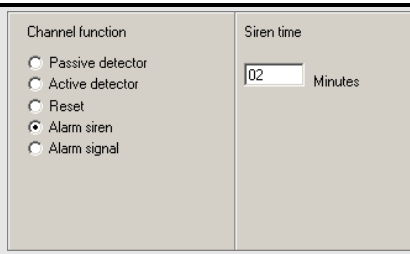
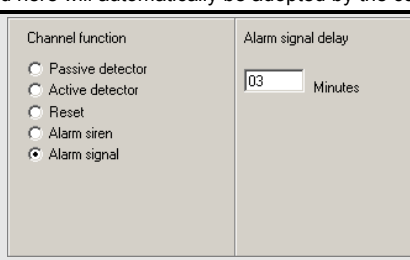
Alarm Signal: 

When an alarm occurs the channel configured with this object will be activated for approx. 1 s to 10 s(1) and can thus be used to trigger a telephone modem or a GSM modem (GSM 8).

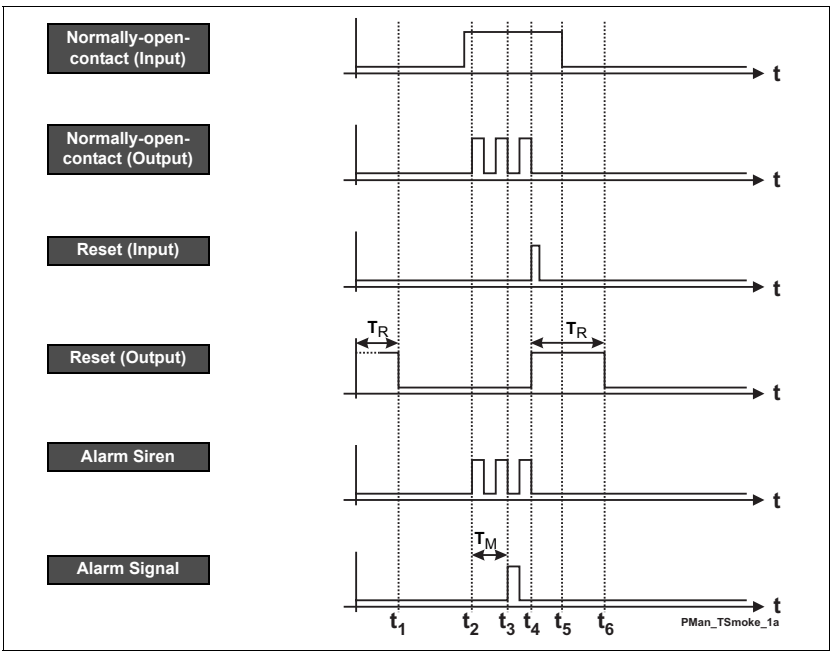
(1) The activating time depends upon the number of channels set up - i.e. those in the basic set-up menu - and varies between 3 s (16 channels) and 11 s (128 channels).

Parameters

Parameters	Description
Passive detector	
Disable address	Enter here an address (A1..P8) or a marker (W1..Z8) upon whose activation ("1" signal) the normally-open-contact is to be excluded from the monitoring and is thus no longer able to trigger an alarm.
Active detector	
Disable address	Enter here an address (A1..P8) or a marker (W1..Z8) upon whose activation ("1" signal) the normally-closed-contact is to be excluded from the monitoring and is thus no longer able to trigger an alarm.

Parameters	Description
Reset	
Reset delay	Here you can determine the delay by which - after the reset button has been pressed - the system is to be set live and an alarm is to be suppressed. This can be utilized for ensuring that the smoke in the measuring chambers has completely dissipated. This time will also be used when downloading the application and when switching on the channel generator.
Alarm siren	
Siren time	With this setting you determine for how long the alarm output is to remain activated when an alarm occurs. The setting can be between 0 and 60 min. A figure entered here will automatically be adopted by the common siren.
Alarm signal	
Alarm signal delay	With this setting you determine how much time is to elapse after the alarm siren is switched on and before an alarm signal is generated. The setting can be between 0 and 10 min.

Timing Characteristics



This diagram illustrates the normal sequence of an alarm and its resetting with the reset button:

t_1: When voltage is applied the system switches live after the selected reset delay T_R has elapsed, as evidenced by the withdrawal of the reset output.

t_2: Following a short delay (approx. 3s) after the fire has been detected (activation of the normally-open-contact), the alarm is triggered. This is in the form of the alarm siren's being sounded and the output of the normally-open-contact's channel being pulsed; the latter indicating the source of the alarm.

t_3: The channel generator activates the alarm signal channel after the set signal delay time T_M has elapsed.

t_4: With the reset button being pressed both the alarm siren and the alarm source indicator are cancelled, although the alarm source (normally-open-contact) remains activated. This is due to the fact that the channel generator ignores all alarm sources during the reset delay.

t_5: With the dissipation of the smoke in the smoke detector the normally-open-contact opens again and deactivates the alarm channel.

t_6: After the reset delay has elapsed the system switches again to live; the reset output is withdrawn.

Example of an Application

Task: Eight rooms in a domestic building are to be equipped with smoke alarms. In the event of an alarm occurring the siren is switched on and the fire brigade notified.

Solution: The alarm channels of the DRD 2 smoke detector are assigned to channels C1 to C8. The source of the alarm is signalled on an indicator board whose LEDs are triggered via a DNP 8A output board. The addresses correspond to those of the alarm contacts. The alarm signal is given via an alarm bell which is activated by the relay of a DSM 8 at address D2. The alarm is reset by a push-button at address B1.

File: *alarmsystems.dkg*

Object	Significance	Channel	Notes / Configuration
Input/Output			
Alarm contact	Smoke detector	C1..C8	DRD 2 or devices from other manufacturers
Push-button input	Reset	D1	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
Semiconductor output	LEDs as source indication on board	C1..C8	Modules DNP 8A, DPN/DNP 4 or DSM 1U/DSM 2/DSM 4E,R/DSM 8
Relay output	Alarm siren	D2	Modules DSM 1U/DSM 2/DSM 4E,R/DSM 8
Relay or semiconductor output	Alarm signal	D3	Modules DSM 1U/DSM 2/DSM 4E,R/DSM 8 for linking to SITM telephone module or GSM 8 modem
ProLine Configuration			
Smoke alarm: Passive detector	Smoke detector	C1..C8	No disable addresses.
Smoke alarm: Reset	Resetting alarm	D1	Reset delay: 2 min.
Smoke alarm: Alarm siren	Audible alarm	D2	Siren time: 10 min.
Smoke alarm: Alarm signal	Activating telephone modem	D3	Alarm signal delay: 3 min.

4.4.5 Intruder Alarm

	• Function: Intruder alarm system with inclusion of normally-closed/normally-open-contacts, toggle switch functions, proximity detectors, enable push-button and switch, code lock enabling, alarm siren and alarm signal. • Application: Linking intruder signal contacts into one alarm system • Insertion either with mouse ("Intruderalarm") or shortcut key "I".

Description

The intruder alarm serves to set up an alarm system consisting of various contacts which can be integrated as normally-closed or normally-open-contacts. By means of interlinking it is thus possible to replace conventional burglar alarm systems.

In addition to the object's own contacts (normally-open and normally-closed-contacts), it is also possible to include any already-configured toggle switch functions and motion detector objects. This is carried out directly at the relevant objects.

An enabled system will trigger an alarm when one or more signal contacts have been activated. The system then flashes the activated signal contacts (as alarm source indication) and, after the set delay, switches the alarm output on. With subsequent actuation of the enable push-button or switch, or the code lock enabling, the channel generator will cease to flash the alarm contacts and will switch the alarm output off.

If an alarm is not acknowledged before the siren delay has elapsed, the system will automatically switch live again.

Note: In order to ensure that the system functions properly it is essential that one of the objects "Manual armouring", "Door lock armouring" or "Code Lock armouring" is configured.

It is not necessary to use the "Door lock armouring" or "Code Lock armouring" objects; their operation is however possible in addition to, or instead of, the "Manual armouring". If two objects are used, the alarm must be acknowledged with the object with which the system had been set live.

The status of the signal contacts can easily be displayed, e.g. on an indicator board. All that is required is that the output channels are coded with the addresses of the signal contacts.

By means of the momentary signal on its channel the "Alarm signal" object enables a telephone modem or GSM modem to be triggered.

The "Common siren" object may also be used for alarm purposes; for details refer to **Chapter 4.4.7 "Alarm Siren / Common Siren"** on **Page 76**.

Via the dialogue window "Channel function" various intruder alarm objects can be selected:

Passive Detector:  This object enables windows, doors etc. with normally-open-contacts to be monitored. If a contact is tripped, and thereby a "1" signal is transmitted on the bus, the alarm will be raised.

Active Detector:  This object enables windows, doors etc. with normally-closed-contacts to be monitored. If a contact is tripped, and thereby a "0" signal is transmitted on the bus, the alarm will be raised.

Toggle Switch:  This object can also be included in the monitoring by selecting the "Use in Intruder alarm" option. For details refer to **Chapter 4.2.3 "The Toggle Switch"** on **Page 30**.

Motion Detector: 

The motion detector function can also be integrated in the intruder alarm. For details refer to **Chapter 4.3.2 "Motion Detector"** on **Page 49**.

Manual armouring: 

This objects enables the inclusion of a push-button for enabling and resetting the alarm.
This object only enables those alarm contacts for which no, or a deactivated, disable address has been entered. It is thus sometimes possible to set up an alarm enabling via the enable button.
When the enable push-button is pressed, the enabling delay (armouring delay) has first to elapse. During this time the channel generator will ignore activated alarm contacts.
If thereafter a non-disabled alarm contact is activated, this channel (as well as the channel of the enable button) will start to pulse, and will trigger the alarm via the siren once the alarm delay has elapsed.
To acknowledge an alarm the enable button has to be pressed once; to restart the alarm system it has to be pressed once more.

Door lock armouring: 

This object enables the incorporation of a switch for activating the alarm system. Its function is similar to that of the enable push-button, whereby here the disable addresses - entered at the alarm contacts - will be ignored. The switch thus carries out a total enabling.
After latching the switch, the enabling delay has first to elapse. During this time the channel generator will ignore activated alarm contacts.
If thereafter an alarm contact is activated, this channel (as well as the channel of the enable switch) will start to pulse, and will trigger the alarm via the siren once the alarm delay has elapsed.
To acknowledge an alarm the enable switch has to be switched off; to set the system live it has to be switched on again.

Code Lock armouring: 

The code lock enabling may be used as an alternative to the enabling switch; the operational effect is identical because it, too, carries out a total enabling of all - even disabled - alarm contacts.
The object awaits a pulse from the code lock for setting the alarm system live; a further pulse is required for acknowledging an alarm which has occurred (see "Manual armouring").

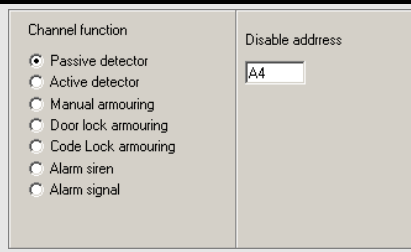
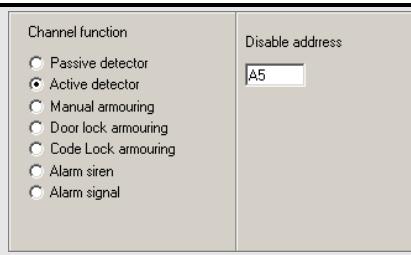
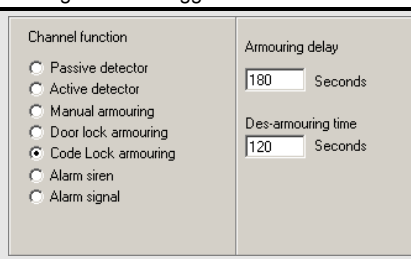
Alarm Siren: 

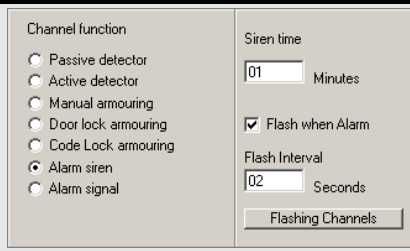
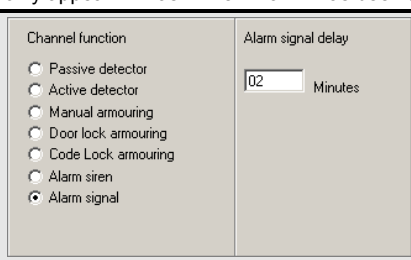
The alarm siren indicates whether an alarm situation has arisen. The channel configured with this object can be used to output the alarm at any chosen output modules. It normally activates a relay output which, in turn, is connected to a siren.
The configuration also permits the alarm output to be pulsed, as well as the selection of any additional channels which will also be pulsed.

Alarm Signal: 

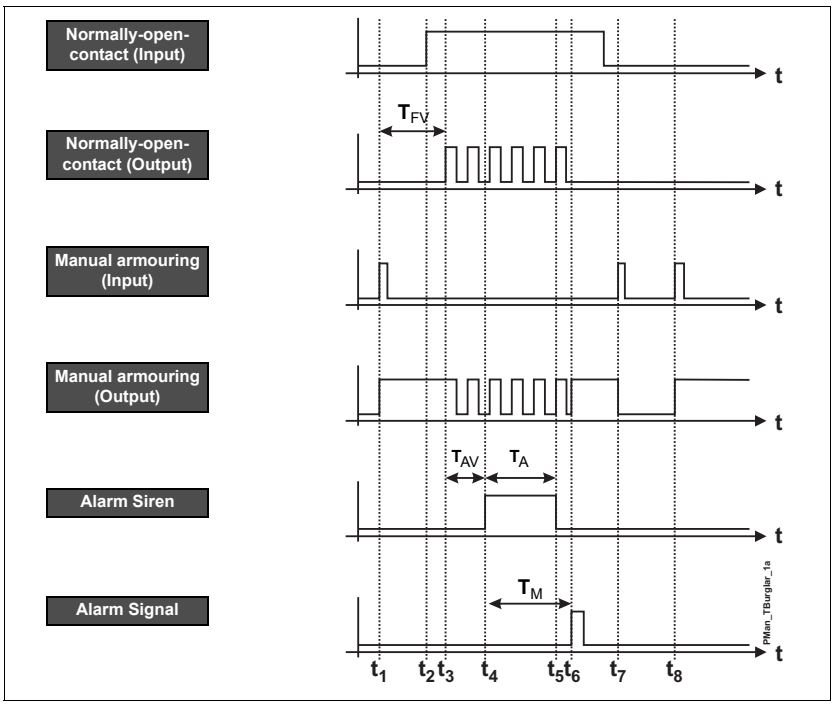
When an alarm occurs the channel configured with this object will be activated for approx. 1 s and can thus be used to trigger a telephone modem or a GSM modem (GSM 8).

Parameters

Parameters	Description
Passive detector	
Disable address	Enter here an address (A1..P8) or a marker (W1..Z8) upon whose activation ("1" signal) the normally-open-contact is to be excluded from the monitoring and is thus no longer able to trigger an alarm.
Active detector	
Disable address	Enter here an address (A1..P8) or a marker (W1..Z8) upon whose activation ("1" signal) the normally-closed-contact is to be excluded from the monitoring and is thus no longer able to trigger an alarm.
Manual armouring **Door lock armouring** **Code Lock armouring**	
Armouring delay	Here you can specify the delay by which - once the enable facility has been actuated - the system will be switched live.
Des-armouring time	With this setting you specify how many seconds have to elapse after an alarm has occurred and before the alarm siren is to be activated. This provides for an early acknowledgment of the alarm and prevents the siren from sounding the alarm, e.g. when entering a building.

Parameters	Description
Alarm siren	
Siren time	With this setting you determine for how long the alarm output is to remain activated when an alarm occurs. The setting can be between 0 and 60 min. The system will immediately be switched live again once the siren time has elapsed and there is no alarm contact still active. A figure entered here will automatically be adopted by the common siren.
Flash when Alarm	When you click this checkbox you are given the opportunity not only to select via the "Flashing Channels" option those channels which are to be flashed on and off, but also to specify their pulse interval (see below). The channel of the alarm siren will, however, still be switched on continuously. ***Note:*** The "Flash Interval" and "Flashing Channels" options will only be displayed if the "Flash when Alarm" box has been ticked.
Flash Interval	Here you can determine the switching-on and -off interval of the pulsed alarm signal. This is conditional upon the "Flash when Alarm" option having been switched on. The time can be between 0 and 60 s. Please bear in mind that pulse times of less than two seconds may be irregular due to the cycle time. If 0 s is entered, the system will adopt the fastest possible flashing rhythm.
Flashing Channels	If you click this switch with the mouse an address matrix will appear in which you can enter the channels which are to be flashed when the alarm occurs. The option will only appear if "Flash when Alarm" has been ticked.
Alarm signal	
Alarm signal delay	With this setting you determine how much time is to elapse after the alarm siren is switched on and before an alarm signal is generated. The setting can be between 0 and 10 min.

Timing Characteristics



The above diagram illustrates the normal sequence of an alarm and its early acknowledgement and resetting to live with the enable push-button:

- t_1: After the channel generator is switched on, the alarm system is set live by pressing the enable button once.
- t_2: An alarm contact is activated, e.g. by an alarmed door being opened. As the enabling delay T_{FV} has not yet elapsed in our example, nothing happens initially.
- t_3: After the enabling delay T_{FV} has elapsed, the alarming sequence is started, i.e. the channel of the alarm contact, as well as the output of the enable button, begin to flash.
- t_4: After the alarm delay (des-armouring time) T_{AV} has elapsed, the channel generator activates the siren.
- t_5: After the siren time T_A has elapsed, the alarm siren channel is deactivated. The flashing of the alarm contact and the enable button output continues.
- t_6: After the alarm signal time T_M of the "Alarm signal" object has elapsed, the channel is momentarily activated. At the same time both the alarm contact and the enable button output are permanently switched on.
- t_7: Pressing the enable button acknowledges the alarm and the enable button output is reset.
- t_8: Pressing the enable button once again switches the system back to live - whilst observing the alarm delay T_{FV}.

Example of an Application

Task: Eight rooms in a domestic building are to be fitted with door and window contacts. In addition, all light switches and two motion detectors are to be integrated. In the event of an alarm a siren is to be activated and the police to be informed via a telephone modem.
An indicator board signals the source of the alarm. It also has to be possible to disable the alarm contacts of each storey individually.

Solution: The alarm contacts of each room are grouped together (connected in series). Each is assigned a normally-open-contact within the range of E1..E8. The source of the alarm is indicated on a board whose LED is triggered via a DNP 8A output board. The addresses correspond to those of the alarm contacts. The alarm is signalled via an alarm bell, which is triggered via a relay of a DSM 8 at address F3. The alarm can be switched live, and also acknowledged, either by the enable button F1 in the entrance hall, or by the code lock enable facility at the front door. The disabling of the individual storeys is by means of two switches.

File: *alarmsystems.dkg*

Object	Significance	Channel	Notes / Configuration
Input/Output			
Alarm contact	Reed contacts at windows and doors	E1..E8	Contacts incorporated via modules DSS 2U/DSS 4U/DSS 8U/DSU 2U/DSU 8
Motion detectors	Generate the alarm if system is activated	F5/F6	Dupline DBM 1 proximity detector
Light contact switch	Push-buttons which serve as alarm source if system is activated	N1..N8 O1..O4	Contacts incorporated via modules DSS 2U/DSS 4U/DSS 8U
Push-button input	Enabling	F1	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
Code lock	Code lock enabling	F1	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8 Hardware must supply a pulse.
Switch input	Inhibiting grd.fl/1st fl	P1/P2	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
Semiconductor output	LEDs as source indication on board	E1..E8 F1..F3	Modules DNP 8A, DPN/DNP 4 or DSM 1U/DSM 2/DSM 4E,R/DSM 8
Relay output	Lighting	N1..N8 O1..O4	Modules DSM 1U/DSM 2/DSM 4E,R/DSM 8
Relay output	Alarm siren	F3	Modules DSM 1U/DSM 2/DSM 4E,R/DSM 8
Relay or semiconductor output	Alarm signal	F4	Modules DSM 1U/DSM 2/DSM 4E,R/DSM 8 for linking to SITM telephone module.
ProLine Configuration			
Intruder alarm: Passive detector	Intruder alarm	E1..E8	I1..E4 (grd.fl.): disabled via switch P1 E5..E8 (1st fl.): disable via switch P2
Motion Detector	Autom. light on/alarm contact	F5/F6	"Use in Intruder alarm" option called up, alarming after 2 pulses.
Toggle switch	Light switch / alarm contact	N1..N8 O1..O4	"Use in Intruder alarm" option called up.
Intruder alarm: Manual armouring	Acknowledging alarm	F1	Armouring delay: 180 s Des-armouring time: 10 s.

Object	Significance	Channel	Notes / Configuration
Intruder alarm: Code lock armouring	Acknowledging	F2	Armouring/des-armouring delay as above
Push button	Disable switch	P1/P2	-
Intruder alarm: Alarm siren	Audible alarm	F3	Siren time: 5 min All lights N1..O4 activated with 3 s pulse.
Intruder alarm: Alarm signal	Activating telephone modem	F4	Alarm signal delay: 3 min.

4.4.6 Water Alarm

	• Function: Water detection system with inclusion of normally-closed/normally-open-contacts, reset button, alarm siren and alarm signal. • Application: Linking water sensors, e.g. the DWS 1, into one alarm system. • Insertion either with mouse ("Wateralarm") or shortcut key "W".

Description

The water alarm serves to set up an alarm system consisting of water sensors, which can be integrated as normally-closed or normally-open-contacts. By means of interlinking it is thus possible to replace conventional alarm systems.

Water alarms are generally incorporated in the system via the "Passive detector" and "Active detector" objects. Upon downloading the ProLine application, or upon the channel generator being switched on, the alarm system is automatically switched live once the reset delay selected for the reset object has elapsed.

An alarm is triggered when one or more signal contacts are activated for a minimum of 3 s to 11 s[1]. The system then flashes the activated signal contacts (as the alarm source indication) approx. once every second. The alarm system is pulsed at an on-off sequence of approx. 3 s to 57 s. If the reset button is pressed again the channel generator will cease to pulse the signal contacts and the alarm output. Should channels then still remain activated, an alarm will be triggered after the reset delay has elapsed.

Note: In order to ensure proper functioning it is essential to configure the "Reset" object.

The status of the signal contacts can easily be displayed, e.g. on an indicator board. All that is required is that the output channels are coded with the addresses of the signal contacts.

By means of the momentary signal on its channel, the "Alarm signal" object enables a telephone modem or GSM modem to be triggered.

The "Common siren" object may also be used for alarm purposes; for details refer to **Chapter 4.4.7 "Alarm Siren / Common Siren"** on **Page 76**.

Via the dialogue window "Channel function" various smoke alarm objects can be selected:

Passive Detector:  With this object you can incorporate water detectors with normally-open-contacts. If a contact is tripped, and thereby a "1" signal is transmitted on the bus, the alarm will be raised.

Active Detector:  With this object you can incorporate water detectors with normally-closed-contacts. If a contact is tripped, and thereby a "0" signal is transmitted on the bus, the alarm will be raised.

Reset:  This object enables the inclusion of a push-button for resetting the alarm and restarting the system.
If a contact is activated while resetting, the system will set off a new alarm once the reset delay has elapsed.
This object has to be configured in order to ensure the proper functioning of the water alarm.

1. The necessary activating time depends upon the number of channels set up - i.e. in the basic set-up menu - and varies between 3 s (16 channels) and 11 s (128 channels).

Alarm Siren: 

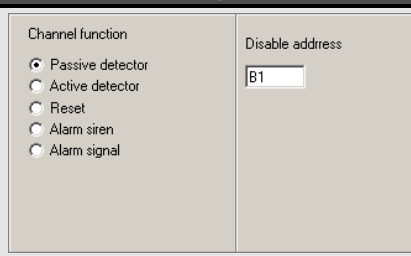
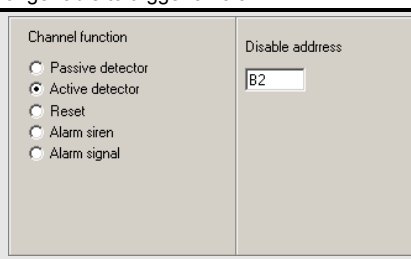
The alarm siren indicates whether an alarm situation has arisen. The channel configured with this object can be used to output the alarm at any chosen output modules. It normally activates a relay output which, in turn, is connected to a siren.
In the event of an alarm this output is pulsed with an on-time of approx. 3 s and an off-time of approx. 57 s.

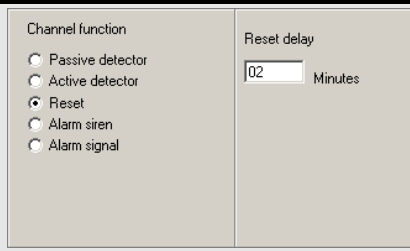
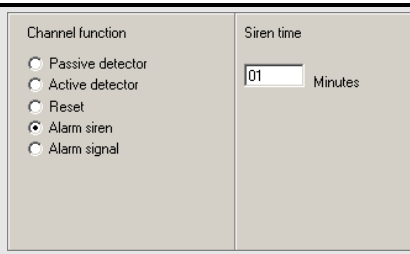
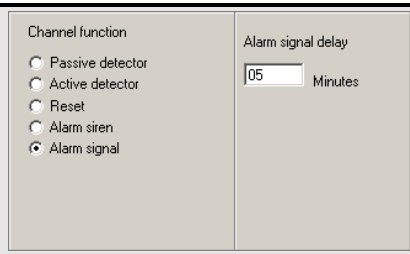
Alarm Signal: 

When an alarm occurs the channel configured with this object will be activated for approx. 1 s to 10 s(1) and can thus be used to trigger a telephone modem or a GSM modem (GSM 8).

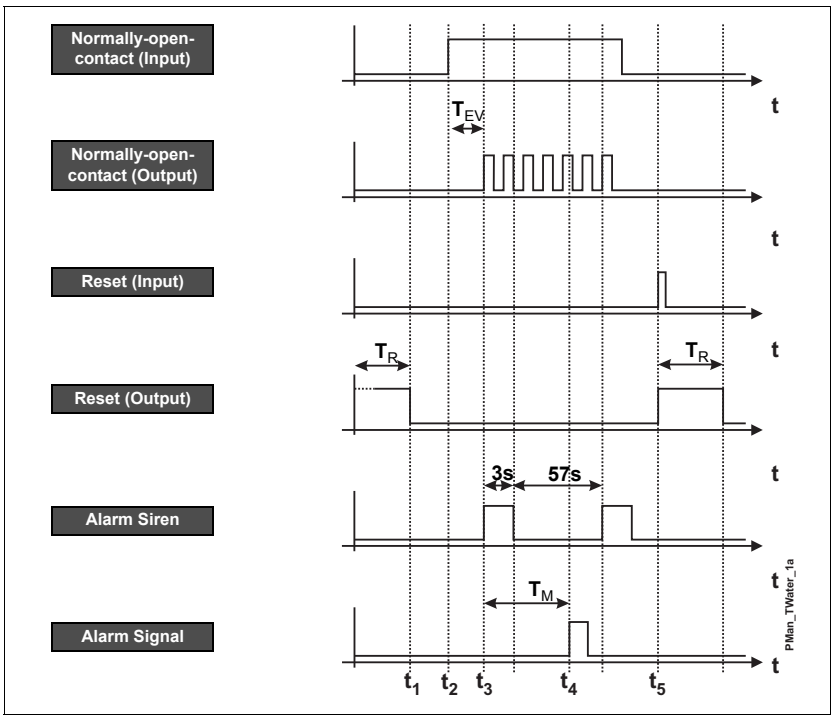
(1) The activating time depends upon the number of channels set up - i.e. in the basic set-up menu - and varies between 3 s (16 channels) and 11 s (128 channels).

Parameters

Parameters	Description
Passive detector	
Disable address	Enter here an address (A1..P8) or a marker (W1..Z8) upon whose activation ("1" signal) the normally-open-contact is to be excluded from the monitoring and is thus no longer able to trigger an alarm.
Active detector	
Disable address	Enter here an address (A1..P8) or a marker (W1..Z8) upon whose activation ("1" signal) the normally-closed-contact is to be excluded from the monitoring and is thus no longer able to trigger an alarm.

Parameters	Description
Reset	
Reset delay	Here you can determine the delay by which, after the reset button has been pressed, the system is to be set live or remain switched off. The reset delay can be between 2 and 10 min.
Alarm siren	
Siren time	With this setting you determine for how long the alarm output is to remain activated when an alarm occurs. The setting can be between 0 and 60 min. A figure entered here will automatically be adopted by the common siren.
Alarm signal	
Alarm signal delay	With this setting you determine how much time is to elapse after the alarm siren is switched on and before an alarm signal is generated. The setting can be between 0 and 10 min.

Timing Characteristics



This diagram illustrates the normal sequence of an alarm and its resetting with the reset button:

t_1: When voltage is applied the system switches live after the selected reset delay T_R has elapsed, as evidenced by the withdrawal of the reset output.

t_2: An alarm contact is activated, whereupon the On delay T_{EV} starts, which varies between 3 s and 11 s.

t_3: After the On delay has elapsed (s. above), the channel generator pulses the activated contact as well as the alarm siren. The latter is then switched on for approx. 3 s and switched off for approx. 57 s.

t_4: After the signal delay T_M has elapsed the alarm signal is activated for a short time.

t_5: With the reset button being pressed the reset delay starts and the siren is switched off.

Example of an Application

Task: Six rooms in a domestic building are to be protected against water damage. When an alarm situation occurs a siren is switched on and the homeowner notified via an SMS message. The affected rooms are to be indicated on an indicator board.

Solution: The alarm channels of the DWS 1 water stop sensor are assigned to channels G1 to G6. The source of the alarm is displayed on an indicator board whose LEDs are triggered via a DNP 8A output board. The addresses correspond to those of the alarm contacts. The alarm signal is given via an alarm bell which is activated by a relay of a DSM 8 at address H2. The alarm is reset by a push-button at address H1.

File: *alarmsystems.dkg*

Object	Significance	Channel	Notes / Configuration
Input/Output			
Alarm contact	Water stop sensor	G1..G6	DWS 1 or devices from other manufacturers
Push-button input	Reset	H1	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
Semiconductor output	LEDs as source indication on board	G1..G6	Modules DNP 8A, DPN/DNP 4 or DSM 1U/DSM 2/DSM 4E,R/DSM 8
Relay output	Alarm siren	H2	Modules DSM 1U/DSM 2/DSM 4E,R/DSM 8
Relay or semiconductor output	Alarm signal	H3	Module DNP 8A for linking to the GSM 8 modem
ProLine Configuration			
Water alarm: Passive detector	Passive detector	G1..G6	No disable address.
Water alarm: Reset	Resetting of alarm	H1	Reset delay: 2 min
Water alarm: Alarm siren	Audible alarm	H2	Siren time: 5 min.
Water alarm: Alarm signal	Activating GSM modem	H3	No delay.

4.4.7 Alarm Siren / Common Siren

- Function: Combined output of ISA, smoke and water alarm at one output.
- Application: Output of several alarms by one siren in addition to, or instead of, individual alarms' own siren.
- Insertion with mouse ("Alarm siren")

Description

The "Common Siren" offers the option of grouping together on one channel the alarms of all alarm systems. The siren then adopts the same alarm characteristics as the respective alarm siren. If several alarms are triggered, they are signalled in the following order of priority:

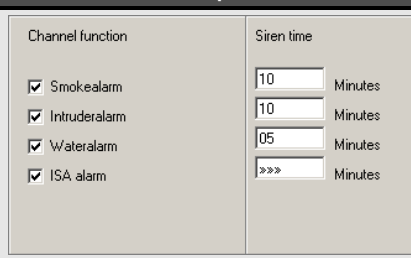
1. Smoke alarm
2. Intruder alarm
3. Water alarm
4. ISA alarm

Operation of the common siren is irrespective of whether a siren of the particular alarm system has been configured.

Note: The siren time entered for the common siren will automatically be adopted by the individual sirens. This is also applicable to the reverse process.

If an alarm is acknowledged and/or reset in time, the channel generator will also withdraw the signal of the common siren.

Parameters

Parameters	Description
Common Siren	
Channel function	Select here one or more alarm systems for which - should its/their alarm(s) be triggered - this siren to be activated in addition.
Siren time	Specify here the max. time for which the siren is to be activated. The duration can be between 0 min and 60 min.

Example of an Application

Task: The various alarm systems (smoke, water, ISA and intruder alarms) in a commercial building are to activate an externally mounted siren.

Solution: The alarm systems of the example previously given are being used. The relay for the external siren is configured at address I1. The siren time of each included alarm will be configured.

File: *alarmsystems.dkg*

4.5 Roller Blind Controls

4.5.1 Rollerblind Up-Down

- Function: Up/Down control of drive motors
- Application: Control of e.g. shutters, roller blinds, awnings and skylights via the Dupline modules DRO 1U, DRO 2 and DRO 4.
- Individual setting possible for roll time and reverse time.
- Slat tilt control for shutters and priority setting for e.g. wind sensor.

Description

The decentral roller blind control permits the operation of Dupline shutter control devices for e.g. shutter, roller blind and awning drives. By combining the Up and Down channels the channel generator is able to ensure trouble-free operation: it prevents simultaneous activation of the raising and lowering channels, and provides for the idle time when switching over between Up and Down directions.

Attention: The DRO 1U, DRO 2 and DRO 4 shutter control devices may only be operated with the Roller Blind Up-Down object! Using other objects will inevitably result in irrevocable damage of the shutter controls and/or motors.

Generally the Up channel has priority over the Down channel. If both are operated simultaneously the channel generator will execute the Up command.

Address Configuration

The roller blind control can only be configured at an uneven address. This means that the Up channel has to be at an uneven (e.g. A1, B5 or P7) and the Down channel at an even address (e.g. A2, B6 or P8). This also reflects the address coding at the shutter control devices: there, too, the Up channel may only be at an uneven output channel (1, 3, 5 or 7), the Down channel only at an even output channel (2, 4, 6 or 8). The following table illustrates a possible configuration:

Device:		DRO 1U		DRO 2				DRO 4							
Output Channel:		1	2	1	2	3	4	1	2	3	4	5	6	7	8
Shutter #1	Up	A1	x	B5	x			C3	x						
	Down	x	A2	x	B6			x	C4						
Shutter #2	Up					D7	x			G5	x				
	Down					x	D8			x	G6				
Shutter #3	Up											A3	x		
	Down											x	A4		
Shutter #4	Up													K7	x
	Down													x	K8

Under no circumstances may those output channels marked with an "x" be assigned to the respective direction; areas marked in grey are available only once at the device. It would thus also be possible of course for e.g. shutter #3 at the DRO 4 to be operated on channels 1 / 2.

Attention: If the motor runs in the wrong direction despite a correct address configuration, then the relevant connecting wires of the motor have been interchanged. In such a case reconnect the wires correctly - under no circumstances may the address be exchanged!

Operation

The Up and Down push-buttons configured at the addresses of the roller blind Up-Down control are extremely easy to operate:

- By pressing the direction button once, the motor will run to the end position or until the end of the roll time.
- Pressing the same direction button again will stop the motor.
- Upon pressing in the opposite direction, the motor will stop momentarily and then drive in the opposite direction up to the end position or until the set roll time has elapsed.

If "Tilting blinds" is selected, the described behaviour differs in the first three seconds:

- If the direction button is pressed for less than three seconds, the motor will stop when the button is released.
- If the direction button is pressed for more than three seconds, the motor will drive to the end position or until the roll time has elapsed. Here, too, it is possible to stop the motor by pressing the button once more or, to get it to run in the opposite direction, by pressing the other direction button.

With the tilting blinds control the shutter drives can be activated for a short time so that - instead of resulting in an Up/Down movement - they adjust the slat angle. However, this function is dependent upon the design of the shutters or blinds.

Automating the roller blind control

There are certainly many options available for an automated operation of roller blinds/shutters. Wind and rain sensors, and also light sensors and time switches, can enhance comfort by automatic operation.

Such functions should normally be implemented by means of logic connectives - provided they have not been configured as a priority address. Here it is preferable to use the slope analysis, which prevents continuous signals and permits operation at any time. Please refer to **Chapter 5 "Logic Set-Up"** on **Page 94**.

Interconnection of several motors

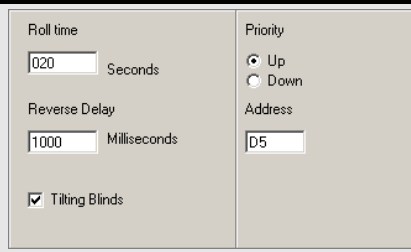
You can achieve simultaneous triggering of several motors by:

1. connecting all motors to separate outputs, and
2. allocating all Up and all Down channels the same address.

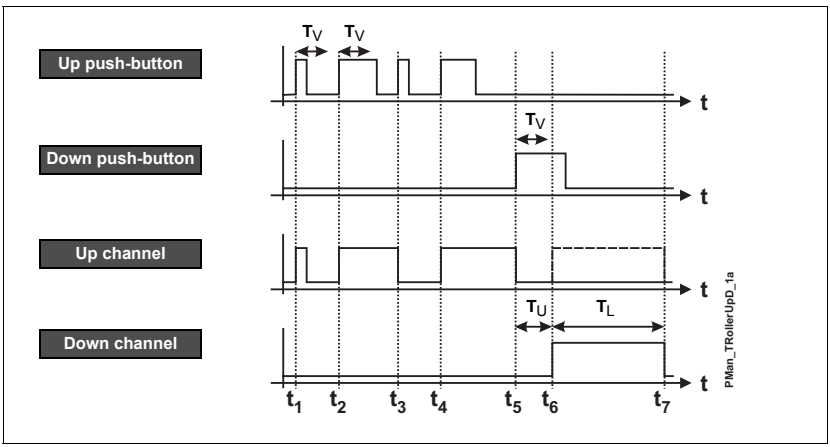
We strongly advise against connecting two or more motors in parallel to one output channel.

The more flexible way for the group or master control of several devices is to utilize the Rollerblind Master object. For details see **Chapter 4.5.2 "Rollerblind Master"** on **Page 83**.

Parameters

Parameters	Description
Rollerblind Up/Down	
Roll time	Enter here the time in seconds that the motor is to be activated in the appropriate direction. The figure can be between 0 and 255 s. The time span should be chosen so as to allow the blinds to reach their end position in both directions, whereby an end position contact has to switch off the drive. Intermediate times could provide e.g. shading; in which case it should be noted, however, that the blinds are to be in one or other of their end positions before the start. The roll time entered here will be overwritten by the master control.
Reverse Delay	Enter here the time in milliseconds that the drive is to remain still when the direction is changed. The figure can be between 500 and 2000 ms.
Tilting Blinds	This option enables the slats of shutters/blinds to be controlled. If this option is selected, the drive will be stopped within three seconds of the push-button being released. You have to activate the tilting blinds option if you want to configure the reverse option for this drive in the rollerblind master control.
Address	If the channel address entered here is activated, the motor will drive for the entered roll time in the direction selected. As long as the specified priority channel is set, any input signals at the shutter channels will be ignored. ***Note:*** The priority address has an even higher priority than the master control.
Priority	Here you can specify in which direction the motor is to drive if the channel entered in the box below has been activated.

Timing Characteristics



The timing shown above relates to a shutter object where the tilting blinds function has been activated (tilting time T_V of 3 s).

t_1: The push-button for the Up direction is being pressed. As the pulse is shorter than the 3 s tilting time T_V, the drive stops upon the button being released.

t_2: Once again the Up direction is being activated. But because the actuation time is longer than the tilting time T_V on this occasion, the control tries to switch the channel on for the total roll time.

t_3: Another press of the push-button in the same direction stops the drive.

t_4: Now the button for the Up direction is pressed once again and the drive is thereby started in the Up direction.

t_5: By pressing the button for the Down direction, the drive is stopped and the transit time (reverse delay) T_U starts.

t_6: After the transit time T_U has elapsed, the motor is activated in the Down direction.

t_7: At the end of the roll time T_L the motor stops. However, in order to reach the end of the roll time, the push-button for Down has to be pressed for longer than the tilting time T_V.

Note: Channel generators up to and including version 3.06 will also activate the Up channel (dotted line) when a Down command is given. From version 3.07 onwards this is no longer the case.

Example of an Application

Task: A number of shutters and one skylight in a domestic building are to be controlled. One group control each are to be provided for the upper and the ground floor, plus one master control which activates all shutters.
To protect the shutters a SIWS/SIWR wind sensor and a SIRW rain sensor are installed. When it rains the shutters are to be lowered, when it is windy they are to be raised; with windy conditions having priority.
The skylight is to be closed when it rains.

Solution: The shutters as well as the skylight are triggered via Dupline DRO shutter control devices. Roller blind master functions are used for the group and master control. The address of the

wind sensor is entered directly as a priority address in the roller blind Up/Down controls. The Down channel of the master control (up. fl.+ grd. fl) is activated via a logic setting by the address of the rain sensor.
For details on the roller blind master function see **Chapter 4.5.2 "Rollerblind Master"** on **Page 83**.

File: *rollerblindcontrol.dkg*

Object	Significance	Channel	Notes / Configuration
Input/Output			
Push-button inputs	Local operation	A1...B4 C1..D4	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
Push-button inputs	Group Master	B5/6, D5/6 D7/8	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
Binary inputs for wind sensor / rain sensor	Priority control	I1 / I2	SIWS/SIWR and SIRW, linked via modules DSS 2U/DSS 4U/DSS 8U/DSU 8, DSM 4E.
Relay outputs	Drives	A1...B4 C1..D4	Modules DRO 1U / DRO 2 / DRO 4
ProLine Configuration			
Rollerblind Up-Down	Shutter/skylight control, decentral	A1...B4 C1..D4	Priority address I1, priority "UP" (skylight: priority address I2, priority "DOWN"). Roll time: This is set to 30 s as the shutters require approx. 20 s.
Rollerblind master	Group control, grd.fl.	B5/6	All shutter control devices of the ground floor are entered here.
Rollerblind master	Group control, up.fl.	D5/6	All shutter control devices of the first floor are entered here.
Rollerblind master	Central control	D7/8	All shutter control devices of the ground and first floors are entered here.
Push button	Incorporating wind/rain detector	I1/I2	With the push button function the channels remain activated while there is wind or rain.

With the logic setting shown below the rain sensor activates all shutters in the Down direction via the master control. When the wind sensor channel is activated, the command will not be carried out by the local roller blind control objects (priority control at every decentral roller blind control object).

Output	Input 1	Function	Input 2
D8	/I2	AND	/I2

4.5.2 Rollerblind Master

- Function: Group or centrally controlled operation of decentral roller blind controls.
- Application: Group or master control of drives for shutters, roller blinds, awnings, skylights etc.
- Roll time with priority over individual roll times settable.
- Collective or sequential start of blinds selectable.
- Reverse time for slat adjustment upon reaching the end position.
- Insertion with mouse ("Rollerblind Master").

Description

With this object both group and master controls can be realized for shutters, awnings, roller blinds and skylights. The decentral roller blind control channels which have to be configured beforehand, (see **Chapter 4.5.1 "Rollerblind Up-Down"** on **Page 78**) are included in the channel matrix of the master control by means of simple markings.

The roll time set for the master control applies to all individual controls and has priority over the roll times set for the latter. Entering a reverse Up time enables automatic adjustment of the slats at the end of a drive cycle: when the set roll time has elapsed, the channel generator switches the drive for the set reverse Up time in the opposite direction.

The master control function offers two operating modes for starting the drives:

1. "Simultaneously": all drives are started in unison.
2. "Sequentially": all drives are started within a space of one second of each other; this avoids peak loads.

Address Configuration

The roller blind master can only be configured at an uneven address. This means that the Up channel has to be at an uneven (e.g. A1, B5 or P7) and the Down channel at an even address (e.g. A2, B6 or P8).

Operation

The Up and Down push-buttons configured at the addresses of the roller blind master control are extremely easy to operate:

- By pressing a direction button once, all selected motors will run to the end position or until the end of the roll time.
- Pressing the same direction button again will restart the set roll time. Stopping is therefore not possible.
- Upon pressing in the opposite direction the motors will momentarily stop (decentrally set reverse Up time) and drive in the opposite direction up to the end position or until the set roll time has elapsed
- After the Down roll time has elapsed the drives run in the Up direction, provided a reverse Up time has been entered and the tilting blinds control has been activated at the decentral roller blind control.
- While the master control command is applied, all drives can also be triggered by the respective decentral roller blind channels. All functions of the decentral roller blind object are available there (stop, reverse direction, slat adjustment).

Automating the roller blind control

There are certainly many options available for an automated operation of several roller blinds/shutters. Wind and rain sensors, and also light sensors and time switches, can enhance comfort by automatic operation.

Such functions should normally be implemented by means of logic connectives. With such a setting it is preferable to use the slope analysis, which prevents continuous signals and permits operation at any time. Please refer to **Chapter 5 "Logic Set-Up"** on **Page 94**.

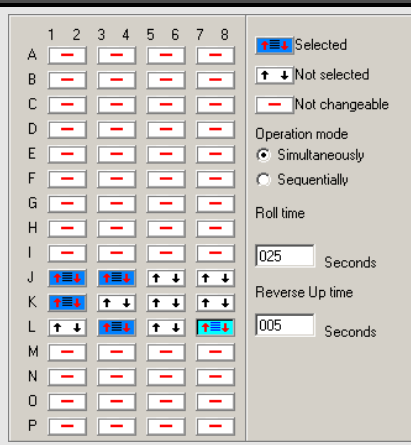
Note: If several roller blind master controls are active at the same time, the roll time entered at the master control of the higher order will apply to all activated blinds.

Example:

You are configuring a roller blind master control at addresses L1/L2 (roll time 45 seconds) and another at addresses L3/L4 (roll time 60 seconds). If both are started simultaneously the decentral blinds will have a roll time of 60 seconds.

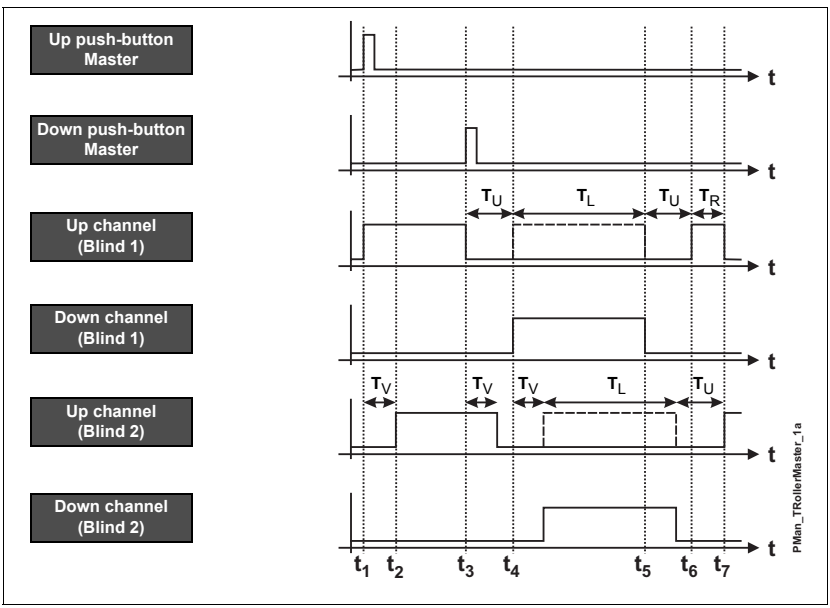
Tip: If several roller blind master controls are active at the same time, the roll time entered at the master control of the higher order will apply to all activated blinds.

Parameters

Parameters	Description
Rollerblind Master	
Operating mode	With this setting you determine whether the blinds are to be started simultaneously or sequentially. In the "Sequentially" setting the blinds will start and stop within one second of each other. This time is also used for direction change and reversing, and does not affect the set roll time.
Roll time	With the roll time you determine for how long all blinds are to be driven. This roll time has priority over the roll time entered for the individual roller blind objects.

Parameters	Description
Reverse Up time	The reverse Up time determines the time in seconds, in which the blinds are to be operated in the opposite direction after the roll time has elapsed, so that the slats are automatically tilted. ***Note:*** The channel generator only carries out the reversing at those decentral roller blind controls where the "Tilting Blinds" option has been activated.

Timing Characteristics



The timing shown above relates to a roller blind master control where the operating mode "Sequentially" has been selected and a reverse Up time T_R has been specified.

t_1: The push-button for Up is pressed. The Up channel of the first drive is activated.

t_2: Because the operating mode "Sequentially" has been selected, the channel generator switches the Up channel of the second drive with a 1 second delay.

t_3: Before the master roll time has elapsed, the Down push-button is being pressed, thereby forcing a change of direction. The motors stop in sequence at this, and the reverse delay T_U entered at the decentral roller blind starts.

t_4: After the reverse delay T_U has elapsed, the first motor starts in reverse direction; the second drive is activated again after 1 s delay (see t_2).

t_5: At the end of the roll time T_L - because of the imminent reversing - the wait for the reverse delay T_U recurs.

t_6: Because of the entered reverse Up time T_R, the drive again travels in reverse direction in order to turn the slats.

t_7: At the end of the reverse Up time T_R the drive of the first blind is stopped.

Note: Channel generators up to and including version 3.06 will also activate the Up channel (dotted line) when a Down command is given. From version 3.07 onwards this is no longer the case. With both versions it is the master command executed last which remains as an output.

Example of an Application

A detailed example in connection with the decentral roller blind control is described on **Page 81**. The relevant file is **rollerblindcontrol.dkg**.

4.6 Counters and Time

4.6.1 Multiplexer (Meter Count Transfer)

Σ	• Function: Object for the acquisition of up to 128 counter data. • Application: Recording energy consumption and hours-run with the DTZ 4 counter module. • Configuration via "Counter range" option in the basic set-up.

Description

The counter channels with the summation sign "Σ" provide a location reserved for the transfer of counter readings. This multiplex transfer of up to 128 counter data was first introduced with the channel generator version 3.00 and enables operation using the Doepke Dupline module DTZ 4.

The transferable data range can be selected in the basic set-up menu via the "Counter range" option. Depending upon the data range a corresponding number of address groups is reserved and thereby a multiplex system initiated.

Note: Reserved addresses may **not** be used for other purposes, such as e.g. to output switch commands.

There are no further configuration possibilities within ProLine - the addressing of the DTZ 4 channels, as well as the transfer and recording of data, is carried out fully automatically by the channel generator.

Appliance configuration

In order to record the meter count the DTZ 4 counter modules have to be correctly set. In addition to setting the measuring range at the appliances, each module must also be allocated an address by means of the rotary switches. For details please refer to the operating instructions of the DTZ 4.

Data format

For a description of the data format used, please refer to the operating instructions of the DTZ 4 and to [1].

Analysis of counter readings

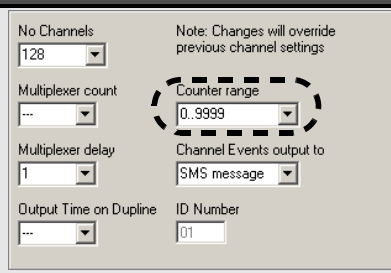
Access to, and analysis of, the recorded counter data takes place exclusively via the modbus communication interface of the channel generator. There are basically two available options for further processing:

1. By displaying the figures using visualising software and operator workstations (such as a PC with the Dupline Webserver);
2. Via communication programmes such as the Dupline DDEServer, which offers an open software interface to e.g Microsoft® Office Applications.

Simultaneous operation with the Multiplex analog data transfer

If meter and analog data transfer are to be used, care must be taken that no superimposing of addresses occurs. The transfer channels of the analog modules have to be set in such a way that they have no common channels with the meter count transfer. Please refer to the following **Chapter 4.6.2 "Multiplexer (Analog Data Transfer)"** on **Page 90**.

Parameters

Parameters	Description
Multiplexer (Meter Count Recording)	
Counter range	With this setting option, which is accessed via ***<Edit><Basic set-up>***, you select the range of the counter. According to the data range, the corresponding number of channel groups are reserved starting with "B".

Counter Range	Reserved Groups
---	none (counter operation disabled)
0..99	B..C
0..9999	B..D
0..999999	B..E
0..99999999	B..F

Example of an Application

Task: On a camping site a total of 64 electricity consumption readings are to be acquired and used via a PC for billing purposes.

Solution: The DTZ 4 counter modules are installed in the service supply units of the individual site pitches; four Dupline SWHM 12 electricity meters each supply one DTZ 4 with the corresponding pulses. The channel generator is configured for meter operation by entering the counter range in the basic set-up. An accounting software with a DDE interface exports the data via the DDE and resets the meter readings upon the arrival of a new guest.
The power for the individual sockets is switched on and off from the PC via the DSM 8 (Doepke DP-Camp software); free channels being used for this purpose.
The DKG employed can, of course, undertake further automating functions.

File: *meterdatarecording.dkg*

Object	Significance	Channel	Notes / Configuration
Input/Output			
Counter input	Acquisition of pulses from electricity meter	B1..F8	Modules DTZ 4: • each module must be assigned an unique starting address; • all modules must be set for the correct number of counter digits.
Relay output	Switching of sockets	G1..N8	Module DSM 8

Object	Significance	Channel	Notes / Configuration
ProLine Configuration			
Counter range	Channels for meter data	B1..F8	In ***<Edit><Basic set-up>***: here the highest possible figure has been selected (0..99.999.999).
Toggle switch	Switch for sockets	G1..N8	-

4.6.2 Multiplexer (Analog Data Transfer)

	• Function: Object for the acquisition of up to 112 analog data. • Application: Fast transfer of multiplex analog data with Dupline analog modules of Messrs. Carlo Gavazzi GmbH. • Configuration via "Multiplexer count" in the basic set-up.

Description

This pioneering method of multiplex transfer permits both the reading and writing of Dupline multiplex analog data. Unlike the AnaLink process with analog sensors, here two address groups are required instead of one channel. This permits more precise analog data to be transferred. In addition, the speed of transfer is higher: under optimum conditions a complete analog value will require one bus cycle, in the case of AnaLink data it would be 256 cycles.

While there are only input modules for the meter count transfer (see **Chapter 4.6.1** on **Page 87**), multiplex analog data can also be output; various Gavazzi-Dupline devices with outputs for 0..20 mA, 4..20 mA and 0..10 V are available for this purpose.

When configuring the multiplexer in the basic set-up ("Multiplexer count" and "Multiplexer delay" options) ProLine will automatically reserve four channels (A1..A4) for the addressing of modules. Addressing on these channels is automatically carried out by the DKG. The data transfer generally takes place on two consecutive address groups (C/D, E/F, G/H, I/J, K/L, M/N and O/P); they are to be set variably at the modules employed, and therefore cannot be reserved by ProLine.

Even though the number of channels is restricted to 16, because only four address channels are reserved - in practical terms up to 112 data can be processed. To achieve this, up to 7 analog channels are assigned the same binary address, but different channel groups will then store the data (see above).

Note: Reserved addresses may **not** be used for other purposes, such as e.g. to output switch commands.

Appliance configuration

It is essential to set the analog modules correctly for the analog data transfer. In addition to setting the transfer channels at the modules, they must each also be allocated a binary address.

For details please refer to the description of the relevant device in the Dupline System Catalogue of Messrs. Carlo Gavazzi GmbH.

Data format

Within the two channel groups (here C and D) the figure "1957" is represented as follows:

Time	Signal On	Data Valid	Sign	1000s	100s				10s				Units			
Channel	C1	C2	C3	C4	C5	C6	C7	C8	D1	D2	D3	D4	D5	D6	D7	D8
Factor				1	8	4	2	1	8	4	2	1	8	4	2	1
Example:																
Channel status	1	1	0	1	1	0	0	1	0	1	0	1	0	1	1	1
Value				1	9				5				7			

Signal On signifies that an input module is continuously supplying the value. **Data Valid** indicates the validity of the value. If "0" is shown under **Sign** it is a positive value, while "1" signifies a negative value.

Processing the analog data

Unlike counter readings, analog multiplex data cannot only be displayed via the modbus communication interface of the channel generator, but can also be altered. There are basically two processing options available:

1. By displaying the figures using visualising software and operator workstations (such as a PC with the Dupline Webserver);
2. Via communication programmes such as the Dupline DDEServer, which offers an open software interface to e.g. Microsoft® Office Applications.

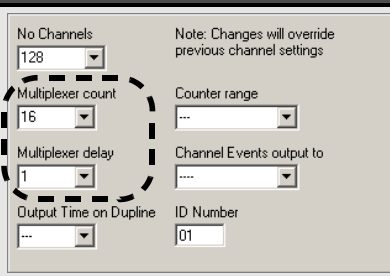
Simultaneous operation with the Multiplexer analog data transfer

If both multiplex processes are to be used, care must be taken that no superimposing of addresses occurs. The transfer channels of the analog modules have to be set in such a way that they have no common channels with the meter count transfer. Please refer to the previous **Chapter 4.6.1 "Multiplexer (Meter Count Transfer)"** on **Page 87**.

Working with the DTG 1 tester

Analog data in this format can easily be displayed and simulated with the DTG 1 (operating mode "Analog BCD"). However, with simulations care must be taken that both the "Signal On" bit and the valid bit have been set (see above).

Parameters

Parameters	Description
Multiplexer (Analog data transfer)	
Multiplexer count	With this setting, accessed via ***<Edit><Basic set-up>***, you specify how many devices are to be addressed. The number depends upon the number of modules used and their input/output channels. From 0 to 16 addresses can be selected; the value 0 disables the process.
Multiplexer delay	With this setting, accessed via ***<Edit><Basic set-up>***, you can determine how quickly the channel generator is to initiate enquiries of the multiplex addresses. This setting is only effective if the multiplex transfer has been activated (at least 1 multiplexer channel selected). As some Dupline multiplex devices need a large part of their computing capacity for internal processing, their response speed is lowered. This can be compensated for by a longer delay; the channel generator then waits for the corresponding number of cycles between enquiries.

4.6.3 Time Channels

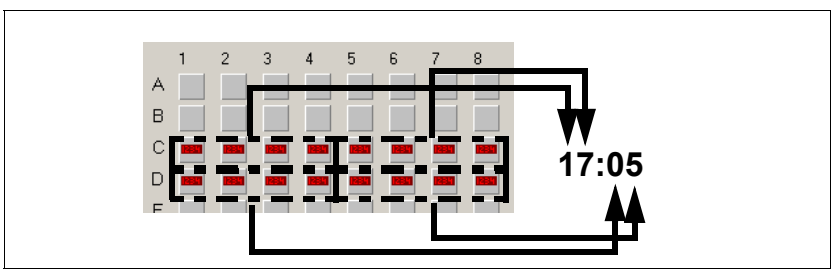
	• Function: Transmission of the time. • Application: Central output of time to output modules which control time displays. • Configuration via the "Output Time on Dupline" option in the basic set-up.

Description

This function enables the time of the channel generator to be transmitted on the Dupline bus. The transfer takes place at the address range selected in the basic set-up. The time is made available in BCD format on two consecutive channel groups. 16 output channels are therefore required for showing the time via suitable display units.

Data format

The data positioning within the 16 channels has the following structure:



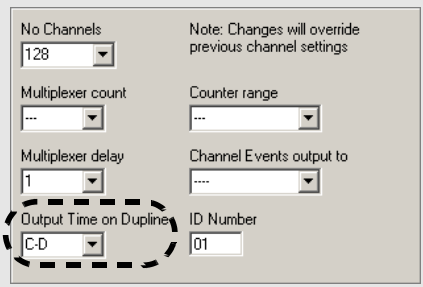
The calculation of the hours and minutes is by means of the BCD code: with each tetrad (4 channels) representing one digit of the time. Within these channels (here groups C and D) the values are as follows:

Time	Hours (10)				Hours (1)				Minutes (10)				Minutes (1)			
Channel	C1	C2	C3	C4	C5	C6	C7	C8	D1	D2	D3	D4	D5	D6	D7	D8
Factor	8	4	2	1	8	4	2	1	8	4	2	1	8	4	2	1
Example:																
Channel status	0	0	0	1	0	1	1	1	0	0	0	0	0	1	0	1
Value	1				7				0				5			

The time indicated here is therefore 17:05.

Note: When selecting the channel groups look out for a possibly configured multiplex transfer of analog data. Their data channels are not marked in ProLine. Superimposition can cause unexpected results.

Parameters

Parameters	Description
Time channels	
Output Time on Dupline	With this setting, accessed via ***<Edit><Basic set-up>***, you select two groups for the time output. Possible settings are "C-D", "E-F", "G-H", "I-J", "K-L", "M-N" and "O-P". If you select "---" there will be no output of the time.

Example of an Application

Task: The time is to be displayed in several assembly halls in a factory.

Solution: The output of the time is configured in the DKG at address groups O and P. The displays are fitted with DNP 8A output boards and NT24-250 power supply units.

File: *timeoutput.dkg*

Object	Significance	Channel	Notes / Configuration
Input/Output			
Semiconductor outputs	Output of channel pattern at time displays	O1..O8 P1..P8	Two DNP 8A modules
ProLine Configuration			
Time	Defining the time channels	B1..F8	In ***<Edit><Basic set-up>***: set the "Output Time on Dupline" option to channel groups "O-P".

Chapter 5 Logic Set-Up

5.1 Introduction

The previous chapters illustrate how easy the actual configuration of the channels is with the predefined objects. The reality is often not quite as straightforward - for example, if an outside light is to be controlled subject to the time of day, or if roller blinds are to be controlled depending upon light and weather conditions.

To solve such problems ProLine makes available to you a powerful tool: the logic setting. With these connectives any desired relationship between individual channels can be set up. You will find a detailed description in the following chapters:

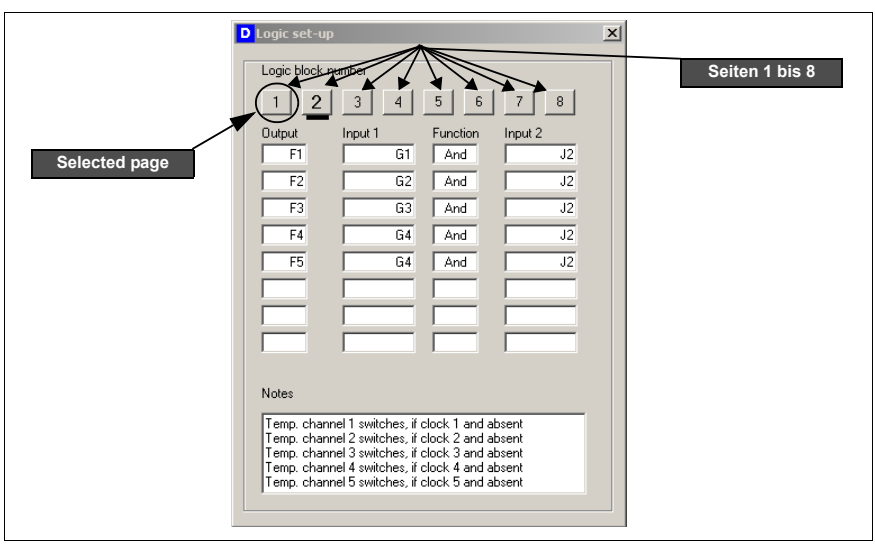
5.2 The "Logic Set-up" Dialogue

5.2.1 Structure

Logic connectives are edited exclusively in the "Logic set-up" dialogue window.

Menu: ***<Edit><Logic set-up>*** **Keyboard:** **Ctrl+L**

The layout of the menu looks as follows:



Eight connectives are always represented on each of the eight pages: the individual pages are selected by clicking the relevant page number. A narrow bar underneath the number box indicates chosen page.

Each connective consists of two inputs which are linked by an operand (e.g. "AND").

The result of such link ("True" or "False") is then assigned to the output:

Designation	Perm.Values	Description	Abbr.(1)
Output	A1..P8 W1..Z8	The channel or marker whose status is to be changed.	O
Input 1	A1..P8 W1..Z8 -, /, \	The channel or marker which represents the first part of the condition for the status change of the output.	I1
Function	AND, OR, XOR	The logic operand which links the two inputs.	Fct
Input 2	A1..P8 W1..Z8 -, /, \	The channel or marker which represents the second part of the condition for the status change of the output.	I2

(1)This abbreviation will be used in the following for the respective component.

5.3 Usage

5.3.1 Connectives and Functions

5.3.1.1 Editing Connectives

Navigating

To jump forward between individual field boxes press the **TAB**; to jump backwards press **Shift+TAB**.

Inserting

Each connective line has to be completed in full, i.e. all four components must be present. The number of connectives used can be selected as required with gaps being permissible.

To insert a connective place the insertion mark with a simple click of the mouse in any desired box of the line. Depending upon the component you can then press a letter or number key.

Changing

Changing is carried out like inserting: position the insertion mark in the box to be edited and overtype the old entry with a new one.

Deleting

You can erase a complete connective line by positioning the cursor with a click of the mouse in the "Function" box and then pressing either Delete or the space bar.

5.3.1.2 Functioning

The inputs and outputs are either channel addresses (A1 to P8) or markers (W1 to Z8).

According to the inputs or connectives (result of the function) the output is set during every bus cycle (max. every 136 ms). This means that the output is set to "0" when the connective is not fulfilled, and to "1" if it is fulfilled.

There are exactly three logic functions, which correspond to those used in mathematics: AND, OR and XOR (Exclusive OR).

AND

The output is always "1" if both inputs are "1".

OR

The output is always "1" if one or both inputs is "1".

XOR (Exclusive OR)
The output is only "1" precisely when just one of the two inputs is "1".
The following table provides an overview of the results of the logic connectives:

AND		
I1	I2	O
0	0	**0**
1	0	**0**
0	1	**0**
1	1	**1**

OR		
I1	I2	O
0	0	**0**
1	0	**1**
0	1	**1**
1	1	**1**

XOR		
I1	I2	O
0	0	**0**
1	0	**1**
0	1	**1**
1	1	**0**

Example:
If, in the case of the function XOR, input 1 (I1) as well as input 2 (I2) are "1", the output (O) adopts the value "0".

5.3.2 Inversion and Slope Analysis

A speciality of connectives is the option of changing how the inputs are evaluated:

- by prefixing an entry with the minus sign ("-") the input will be inverted before processing, i.e. if the input was "0", it is given the value "1" for the analysis and vice versa;
- by prefixing with a slash "/" only the **rising** slope of the input will be analysed;
- by prefixing with a back-slash "\" only the **falling** slope of the input will be analysed.

The altered analysis affects neither input channels nor markers!

5.3.2.1 Operation

The following table shows how the signs for inverting and slope analysis can be inserted in, or deleted from, the input boxes of the logic connectives:

Prefix	Inserting	Deleting
„-“	• by pressing the - key	• by again pressing the - key • by pressing the Del key
„/“	• by pressing the & key (Shift + 7) • by pressing the x- or ÷ key on the number pad	• by twice pressing the - key • by twice pressing the Del key
„\“	• by twice pressing the x or ÷ key on the number pad	• by pressing the - key • by pressing the Del key

Tip: To change the signs for the rising and falling slopes press the x or the ÷ key on the number pad several times.

5.3.2.2 Inverting

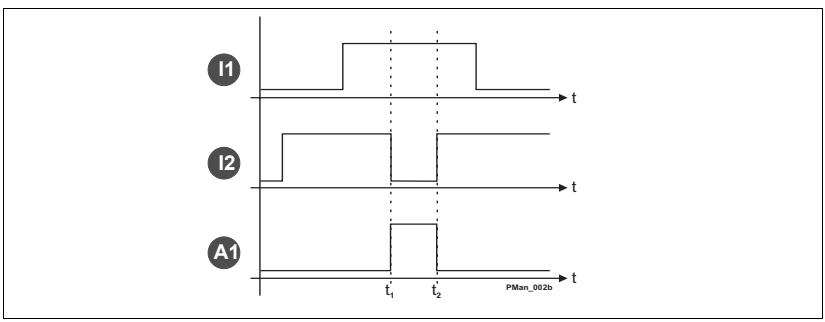
Inversions can be used with channels as well as markers. Moreover, there are no restrictions on the type of output.

Example:

The focus is on the following logic set-up

Output	Input 1	Function	Input 2
A1	I1	AND	-I2

The following diagram illustrates the time sequence:



In this example output "A1" becomes active only when input I1 is **active** and input I2 is **not active** (section between the dotted lines). The internal processing in the channel generator inverts the value of I2 (i.e. considers it to be active) before the analysis.

5.3.2.3 Slope Analysis

The analysis of rising and falling slopes can only be used at channels A1 to P8. As this is a dynamic process over only two bus cycles, an object configuration needs to be selected here which is able to process pulses. This would, for example, be objects such as "Toggle switch", "Timer" (with activating-pulse processing) or "Master controls".

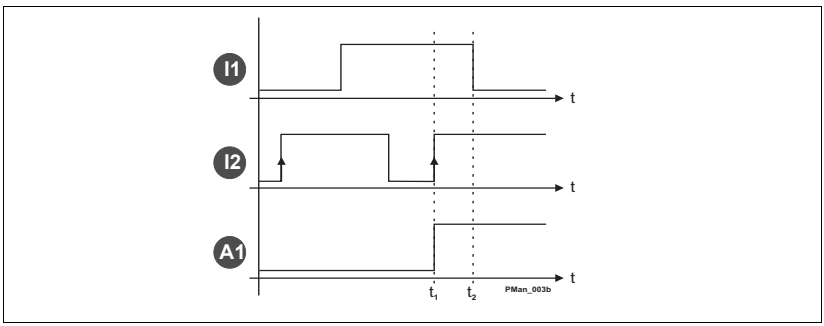
It would certainly also make sense to set a "Push button" function with such connections; however, it should be borne in mind that in this case the output will only be active for two cycles.

Example:

The focus is on the following logic set-up

Output	Input 1	Function	Input 2
A1	I1	AND	/I2

The following diagram illustrates the time sequence:



Here two conditions have to be fulfilled ("AND"): I1 must be active and I2 must have a positive slope. This is only the case at t_1. When the signal of I1 drops (r.h. line), output A1 remains set.

The diagram is based on the assumption that, for example, a toggle switch function is configured at the channel used as output A1. This function only requires one impulse in order to execute a switching process. A "Push button" function would immediately return to its inactive status.

5.3.3 Using Markers

Dupline makes available markers with which you can "save" logic settings so that they can be used in other connectives.

Properties:

- The markers are located at channels W1..8, X1..8, Y1..8 and Z1..8.
- The markers will not be initialised when voltage is applied at the channel generator.
- The markers will not be saved if the voltage drops off at the channel generator.
- Markers behave in basically similar fashion to the "Toggle switch", i.e. the value of the marker changes immediately upon the result of the logic setting.
  However, in the case of markers no slope analysis is possible.

Application

- If a channel is to be set depending upon more than two other channels, markers assist in co-ordinating the connectives. The following example illustrates the co-ordination of channels A1, A2 and A3 and their assignment to B1:

Output	Input 1	Function	Input 2
W1	A1	AND	A2
B1	**W1**	AND	A3

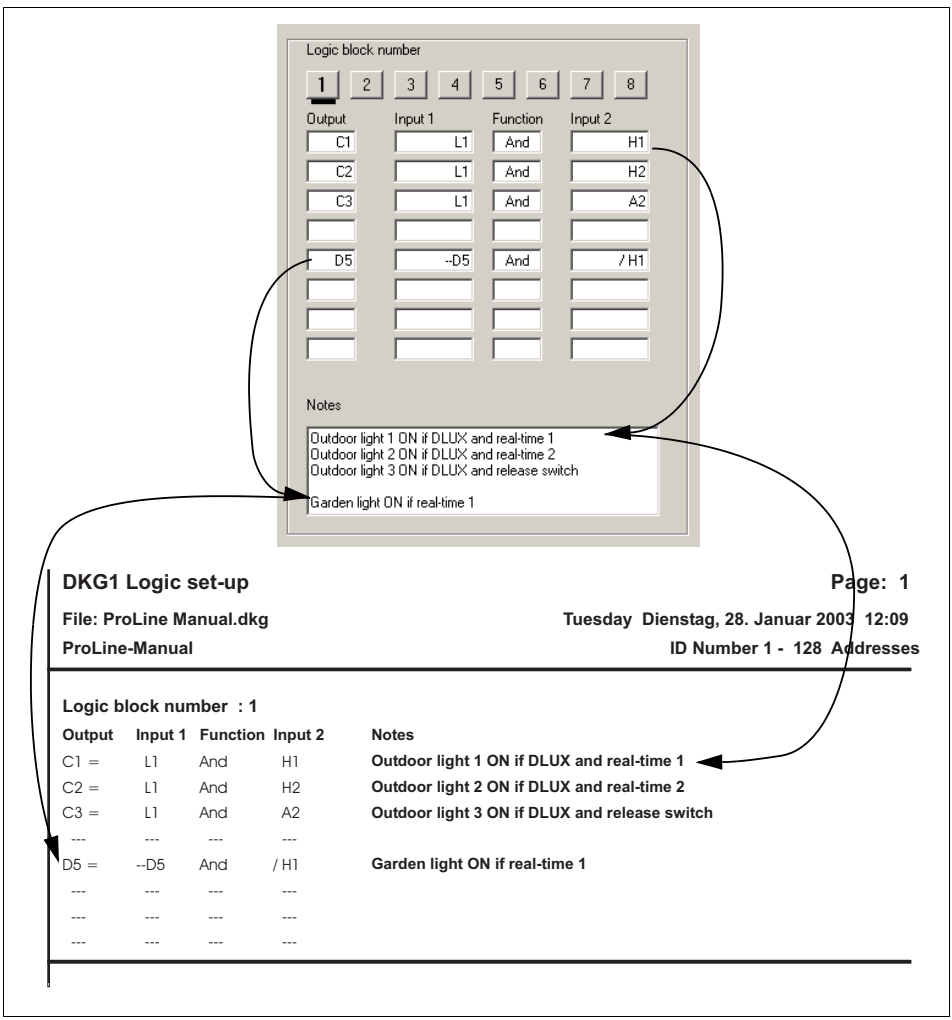
- Markers can be used in place of channels for most objects in the matrix, e.g. decentral roller blind Up-Down control. It is thus possible to realize e.g. priority controls which are dependent upon several states.

5.3.4 Internal Processing of Connectives

The channel generator processes the connectives from page 1 to page 8 and within each page from top to bottom.

5.4 Notes and Documentation

For the purpose of subsequent documentation of the logic settings (see **Chapter 3.5.4 "Printing File"** on **Page 11**) it makes sense to enter comments concerning the logic settings in the "Notes" field. When printing at a later time these notes will appear next to the lines so that each individual function can be annotated:



Chapter 6 Examples

6.1 Introduction

In order to facilitate your entry into the logic set-up this chapter provides a so-called "Tour" which guides you step by step through a defined task plus some other selected cases. Here, too, it should be noted that we cannot cover every possible task set.

To undertake these exercises you will require a channel generator and a DTG 1 tester (Order No. 09 501 113) with which you can simulate the input and output signals. Our demonstration case (Order No. 09 501 999) contains a wide range of components which are particularly suitable for these exercises.

6.2 Tour

Please note that the examples given here build upon each other. You will find the channel generator files either on the documentation CD or on the internet at http://www.doepke.de.

Before using these examples please check the function. Doepke Schaltgeräte GmbH & Co.KG accepts no liability for any damage arising from the use of these examples!

6.2.1 Step 1: Time-controlled lighting

Task: The outside lighting is to be switched on and off depending upon the time of day.

Solution: No connectives are required in this step as the time switch directly switches the relay coded at address A1.

File: *tour_01.dkg*

Object	Significance	Channel	Notes / Configuration
Input/Output			
Relay output	Outside light	A1	Modules DSM 1U/DSM 2/DSM 4E,R/DSM 8
optional: Push-button input	Light switch	A1	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
ProLine-Configuration			
Real-time	Time controls	A1	Switching on from 20:00 to 06:00

6.2.2 Step 2: Time- and light-controlled lighting

Task: A DLUX light level sensor is used in addition to control the outside lighting dependent upon the prevailing light. The outside light is to be switched on only if the time switch is active (switched on).
No provision for manual operation is required.

Solution: For this purpose the time switch needs to be separated from the output channel (at address C1).

File: *tour_02.dkg*

Object	Significance	Channel	Notes / Configuration
Input/Output			
Relay output	Outside light	A1	Modules DSM 1U/DSM 2/DSM 4E,R/DSM 8
DLUX	Light sensor	D1	All 8 channels of the DLUX can be used for the evaluation of the light level.
ProLine-Configuration			
Push button	Output channel	A1	
Real-time	Time control	C1	Time switch with holiday settings.
Analog sensor: Light sensor	Lighting control	D1	On, if < 10 Lux; Off, if > 50 Lux

In this step the output channel A1 has been configured as a push button function as no manual operation is required and thus only a simple logic set-up being necessary:

Logic block number				
Output	**Input 1**	**Function**	**Input 2**	**Notes**
A1	C1	AND	D1	Outside lighting ON if clock and DLUX are active.

6.2.3 Step 3: Light-level controlled lighting with manual operation

Task: Outside lighting, solely light-level controlled, is to be set up so that it can also be operated manually with a switch.

Solution: Here it makes sense to configure both the relay and the push-button input at the same address (A1). The push-button is thus able to override the automatic lighting until one of the light thresholds is again exceeded.

File: *tour_03.dkg*

Object	Significance	Channel	Notes / Configuration
Input/Output			
Relay output	Outside light	A1	Modules DSM 1U/DSM 2/DSM 4E,R/DSM 8
Push-button input	Light switch	A1	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
ProLine-Configuration			
Toggle switch	Manual operation	A1	

Object	Significance	Channel	Notes / Configuration
Analog sensor: Light sensor	Lighting control	D1	On, if < 10 Lux; Off, if > 50 Lux

As channel A1 is a toggle switch function, we now have to work with slopes in the logic set-up:

Logic block number				
Output	**Input 1**	**Function**	**Input 2**	**Notes**
A1	-A1	AND	/D1	On-condition for outside light: DLUX ON
A1	A1	AND	\D1	Off-condition for outside light: DLUX OFF

As is the case with a "normal" light control, the toggle switch function always requires one pulse for switching on and another for switching off; the channel thus toggles with every pulse. The light sensor, however, supplies a pulse in both cases (upon reaching the upper and lower limits of the light thresholds). It must therefore be ensured that the toggle switch function switches on only at the positive slope of the light sensor (below threshold) and switches off at the negative slope of the light sensor (above threshold).

This is achieved by including in the connective the status of the toggle switch at A1:

Switch On: The first connective ensures that A1 is toggled only by the rising slope of the sensor at D1 when A1 is switched off ("-A1").

Switch Off: The second permits the toggling by the sensor only when A1 has been switched on beforehand.

6.2.4 Step 4: Automatic lighting with manual operation

Task: It is somewhat more involved when the outside lighting is to be switched on only at specific times **and** depending upon the light intensity. Here the relay may only be actuated when the time switch and the light sensor send a "1" signal.

Solution: The simplest solution is to use an "auxiliary channel": a push button function configured at a free channel (A8) is switched on only when both input signals are switched on:

File: *tour_04.dkg*

Object	Significance	Channel	Notes / Configuration
Input/Output			
Relay output	Outside light	A1	Modules DSM 1U/DSM 2/DSM 4E,R/DSM 8
Push-button input	Light switch	A1	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
ProLine-Configuration			
Toggle switch	Manual operation	A1	
Push button	Aux. Channel	A8	Co-ordinates signals from DLUX and clock.
Real-time	Time control	C1	Time switch with holiday settings.
Analog sensor: Light sensor	Lighting control	D1	On, if < 10 Lux; Off, if > 50 Lux

The logic set-up can then look as follows:

Logic block number				
Output	**Input 1**	**Function**	**Input 2**	**Notes**
A8	C1	AND	D1	On-condition for auxiliary channel
A1	-A1	AND	/A8	On-condition for outside light: auxiliary channel ON
A1	A1	AND	\A8	Off-condition for outside light: auxiliary channel OFF

But just how this application functions leaves itself open to argument: when the outside light has been manually switched on, will it be switched off only if the clock, as well as the light sensor, have been active at the same time?
An improved version is explained in the next step.

6.2.5 Step 5: Automatic lighting with manual operation (improved)

Task: The application illustrated above makes more sense if the falling slopes of the clock and light sensor are also analysed.

Solution: This can easily be accomplished by extending the logic connectives.

File: *tour_05.dkg*

Logic block number				
Output	**Input 1**	**Function**	**Input 2**	**Notes**
A8	C1	AND	D1	On-condition for auxiliary channel
A1	-A1	AND	/A8	On-condition for outside light: auxiliary channel ON
A1	A1	AND	\A8	Off-condition for outside light: auxiliary channel OFF
A1	A1	AND	\C1	Off-condition for outside light: clock OFF
A1	A1	AND	\D1	Off-condition for outside light: DLUX OFF

6.2.6 Step 6: Inclusion of a roller blind master control

Task: Here several shutters are to be operated together with the outside light: when it gets dark at the specified time the shutters are to be lowered, when it gets light again they are to be raised.

Solution: The additional inclusion of one or more roller blinds in the previous application simply constitutes an extension of the set-up: by inserting the roller blind master and logic settings the shutters will then be lowered when it is dark and raised when it is light.

File: *tour_06.dkg*

Object	Significance	Channel	Notes / Configuration
Input/Output			
Relay output	Outside light	A1	Modules DSM 1U/DSM 2/DSM 4E,R/DSM 8

Object	Significance	Channel	Notes / Configuration
Push-button input	Light switch	A1	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
Shutters 1..3	Shutters	B1..B6	Modules DRO 1U, DRO 2 or DRO 4
Optional: Blinds master switch	Switch for shutter master command	B7/B8	With these switches the shutters could also be operated manually.
ProLine-Configuration			
Toggle switch	Manual operation	A1	
Push button	Aux. Channel	A8	Co-ordinates signals from DLUX and clock.
Roller Blind Up-Down	Shutter control	B1..B6	
Roller blind master	Master control	B7/B8	
Real-time	Time control	C1	Time switch with holiday settings.
Analog sensor: Light sensor	Lighting control	D1	On, if < 10 Lux; Off, if > 50 Lux, inverted

The logic set-up needs merely to be extended by two lines - for each direction of travel a connective has to be provided to activate the addresses.

Logic block number				
Output	**Input 1**	**Function**	**Input 2**	**Notes**
A8	C1	AND	D1	On-condition for auxiliary channel
A1	-A1	AND	/A8	On-condition for outside light: auxiliary channel ON
A1	A1	AND	\A8	Off-condition for outside light: auxiliary channel OFF
A1	A1	AND	\C1	Off-condition for outside light: clock OFF
A1	A1	AND	\D1	Off-condition for outside light: DLUX OFF
B7	\A8	AND	\A8	Blinds master UP when light
B8	/A8	AND	/A8	Blinds master DOWN when dark

Here, too, there are of course possibilities for improving, or extending, the functionality - give free rein to your own ideas.

6.3 Selected Tasks

Here are a few small applications which frequently occur in practice. These examples are also available on the documentation CD and at http://www.doepke.de.

Before using these examples please check the function. Doepke Schaltgeräte GmbH & Co. KG accepts no liability for any damage arising from the use of these examples!

6.3.1 Master ON/OFF with one Push-button

Task: Two push-buttons are normally required for the master control: one for switching on and another for switching off. If only one switch is to be used for switching over between master On and Off, then logic connectives are required.

Solution: The push-button for the master On/Off change-over is coded at address B1 and in ProLine a toggle switch function is configured. The actual master functions are at addresses B2 and B3.

File: *master_on_off_pushbutton.dkg*

Object	Significance	Channel	Notes / Configuration
Input/Output			
Relay outputs	Loads 1..4	A1..A4	Modules DSM 1U/DSM 2/DSM 4E,R/DSM 8
Push-button input	Master On/Off	B1	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
ProLine-Configuration			
Toggle switch	Manual operation of loads 1..4	A1..A4	
Toggle switch	Activating master controls	B1	Provides slopes for activating master commands.
Master control	Master ON	B2	All loads ON.
Master control	Master OFF	B3	All loads OFF.

The logic set-up looks as follows:

Logic block number				
Output	**Input 1**	**Function**	**Input 2**	**Notes**
B2	-B3	AND	/B1	Rising slope of push-button for master On
B3	-B2	AND	\B1	Falling slope of push-button for master Off

A single pressing of the button (rising slope) thus activates the master ON command, and a second press (falling slope) the master OFF command. It is thus ensured that no master ON command is executed as long as an OFF command is operational ("-B3") and vice versa ("-B2").

6.3.2 Two Functions with one Push-button

Task: Frequently two functions are to be carried out by one push-button, e.g. when there is insufficient room to fit another. In this example we want to control two loads with one push-button so that they are switched on and off alternately.

1. Pressing: Load 1 on
2. Pressing: Load 1 off, Load 2 on
3. Pressing: Load 1 on, Load 2 on
4. Pressing: Load 1 off, Load 2 off

Solution: The solution is surprisingly simple: in addition to the output channel for each load (A1/A2) we only require two logic connectives. The push-button for activating the output has to be configured at the channel of the first output (A1).

File: *two_functions_1.dkg*

Object	Significance	Channel	Notes / Configuration
Input/Output			
Push-button input	Push-button for 2 loads	A1	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
Relay output	Output/load 1	A1	Modules DSM 1U/DSM 2/DSM 4E,R/DSM 8
Relay output	Output/load 2	A2	Modules DSM 1U/DSM 2/DSM 4E,R/DSM 8
ProLine-Configuration			
Toggle switch	2-function switch and Output/load 1	A1	
Toggle switch	Output/load 2	A3	

The logic set-up looks as follows:

Logic block number				
Output	**Input 1**	**Function**	**Input 2**	**Notes**
A2	-A2	AND	\A1	Switch on output 2, if switched off and output 1 has falling slope.
A2	A2	AND	\A1	Switch off output 2, if switched on and output 1 has falling slope.

6.3.3 Two Functions with one Push-button (time-controlled)

Task: In this example we want to control two loads via one push-button so that, when the switch is pressed for a brief period only, the first load switches on or off, and with prolonged pressing only the second is switched on or off.

Solution: We require four channels for the solution: the push-button input, a timer and an output for each load. With a short activation (before the on-delay of the timer has elapsed) a connective ensures that output 1 is switched on or off. With longer pressing of the switch (on-delay elapsed) the timer starts which in turn switches output 2.

File: *two_functions_2.dkg*

Object	Significance	Channel	Notes / Configuration
Input/Output			
Push-button input	Push-button for 2 loads	A1	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
Relay output	Output/load 1	A3	Modules DSM 1U/DSM 2/DSM 4E,R/DSM 8
Relay output	Output/load 2	A4	Modules DSM 1U/DSM 2/DSM 4E,R/DSM 8
ProLine-Configuration			
Push button	2-function switch	A1	
Timer	Aux. Timer for time delay	A2	Operating mode: On/Off delay (1 s each), time delay Additional trigger: A1
Toggle switch	Output/load 1	A3	Switches on/off with short actuation.
Toggle switch	Output/load 2	A4	Switches on/off with longer actuation.

The logic set-up looks as follows:

Logic block number				
Output	**Input 1**	**Function**	**Input 2**	**Notes**
A3	\A1	AND	-A2	Operation of A1 (push-button) starts the timer. Upon release of the button before the on-delay has elapsed, the timer does not switch on, thus this condition is met, and generates a pulse at A3 (switching On/Off).
A4	A1	AND	/A2	Operation of A1 (push-button) starts the timer. Upon release of the button after the on-delay has elapsed, the timer switches on, thus this condition is met, and generates a pulse at A4 (switching On/Off).

6.3.4 Time-delayed Toilet Ventilation

Task: In this exercise a toilet ventilator is to be activated with a 5 min. delay (after the light has been switched on).

Solution: The toilet light is configured as a toggle switch at address 1. This triggers the timer at address A2 with which the relay for the ventilator is also coded.

File: *wc_ventilator.dkg*

Object	Significance	Channel	Notes / Configuration
Input/Output			
Push-button input	Light switch	A1	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
Relay output	Ventilator	A2	Modules DSM 1U/DSM 2/DSM 4E,R/DSM 8
ProLine-Configuration			
Toggle switch	Actuation of lighting	A1	
Timer	Activating ventilator	A2	Operating mode: On/Off delayed (5 min. each), "Pulses by activation"

The logic set-up looks as follows:

Logic block number				
Output	**Input 1**	**Function**	**Input 2**	**Notes**
A2	/A1	AND	/A1	Rising slope of switch activates the ventilator timer.

The timer for the ventilator is activated by the rising slope of the toilet light and switches automatically off again after the extension time has elapsed.

6.3.5 Temperature-controlled Conservatory Window

Task: Here the window of a conservatory is to be opened when the inside temperature exceeds 22ºC and closed if it drops below 17ºC.

Solution: The window is controlled via the "Roller Blind Up-Down" object at B1/B2; the manual operation is via two push-buttons which are also coded for B1 and B2. The temperature evaluation is via a PT1000 sensor at address A1 which activates the roller blind control via logic settings.

File: *conservatory.dkg*

Object	Significance	Channel	Notes / Configuration
Input/Output			
Shutter control unit	Window drive	B1/B2	Modules DRO 1U, DRO 2 or DRO 4
Add. optional: Push-button input	Local control	B1/B2	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
ProLine-Configuration			
Roller Blind Up-Down	Local shutter control	B1/B2	Do not forget roll time!
Analog sensor: Temperature Sensor	Measuring inside temperature	A1	For DTS 1: Input range -60ºC... +30ºC Off, if < 17ºC, On, if >22ºC, not inverted

The logic set-up looks as follows:

Logic block number				
Output	**Input 1**	**Function**	**Input 2**	**Notes**
B1	-B2	AND	/A1	Exceeding the temperature opens the window (B1: Up command, only if DOWN command B2 not active)
B2	-B1	AND	\A1	Falling below the temperature closes the window (B1: Up command, only if UP command B1 not active)

6.3.6 Holiday Control for Lighting and Shutters with Disable Feature

Task: An important and popular function of Dupline is the automatic control of lights and shutters when nobody is at home - for example while on holiday. Often, however, people will want to suppress the automatic processes when they are at home - it must therefore be possible to switch off the control setting.
In our example eight loads (e.g. lights and sockets), as well as four shutters, are to be controlled.

Solution: We configure the loads at addresses A1 to A8, the shutters at B1 to B8, the change-over switch, the time switch and the master controls on group C.

File: *holidayfunction.dkg*

Object	Significance	Channel	Notes / Configuration
Input/Output			
Push-button input	Light switch	A1..A8	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
Shutter control units	Shutter drive	B1..B8	Modules DRO 1U, DRO 2 or DRO 4
Add. optional: Push-button input	Local control	B1..B8	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
Switch	Change-over: At home (0)/Holiday (1)	C1	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
ProLine-Configuration			
Toggle switch	Light switch	A1..A8	
Roller Blind Up-Down	Local shutter control	B1..B8	Do not forget roll time!
Push button	Change-over At home/Holiday	C1	Off: At home, On: Holiday setting
Real-time	Automatic	C2	Any desired times possible: if using holiday setting the behaviour can be altered for certain days.
Master function	Master ON	C3	Switches on all loads A1..A8 and the roller blind master function UP (C5).
Master function	Master OFF	C4	Switches off all loads A1..A8 and the roller blind master function DOWN (C6).
Roller Blind Master	Master control shutters B1..B8	C5/C6	Drives all shutters up or down.

The logic set-up looks as follows:

Logic block number				
Output	**Input 1**	**Function**	**Input 2**	**Notes**
C3	C1	AND	/C2	Master ON when absent and pos. slope of time switch
C4	C1	AND	\C2	Master OFF when present and pos. slope of time switch

Of course, not just one group of shutters and one group of lights should be controlled - in order to achieve a proper absence simulation, the application can always be further extended as desired.

6.3.7 Random Control

Task: There is as yet no "Absence Simulation" object available for ProLine. But on occasion it can be quite handy if shutters and lights are "randomly" raised or lowered and switched on or off. One possibility has already been shown in the previous example; in this example the shutters are to be controlled so that they are activated at more or less indeterminate times.

Solution: In order to achieve near unpredictable control, we utilize four pulse generators whose ON and OFF signal times are configured differently. By "AND-linking" selected pulse generators we achieve a varying switching pattern.
An auxiliary channel, configured as toggle switch function, insures that neither two Up, nor two Down, commands are generated consecutively.
As before, the shutters are configured at addresses B1 to B8; this time, however, two roller blind master functions are being used for two shutters each. The first is activated via a logic set-up, the second via the master function at C3/C4. The change-over switch is configured at C1. It activates/deactivates the timer with which the automatic setting can be switched on and off.

File: *randomcontrol.dkg*

Object	Significance	Channel	Notes / Configuration
Input/Output			
Push-button input	Light switch	A1..A8	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
Shutter control units	Shutter drive	B1..B8	Modules DRO 1U, DRO 2 or DRO 4
Add. optional: Push-button input	Local control	B1..B8	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
Switch	Change-over: At home (0)/Holiday (1)	C1	Modules DSS 2U/DSS 4U/DSS 8U/DSU 8
ProLine-Configuration			
Toggle switch	Light switch	A1..A8	
Roller Blind Up-Down	Shutter control	B1..B8	Do not forget roll time!
Push button	Change-over At home/Holiday	C1	Off: At home, On: Holiday setting
Master control	Master ON	C3	Switches all loads A1..A8 and the roller blind master function UP (C7) on.
Master control	Master OFF	C4	Switches all loads A1..A8 off and the roller blind master function DOWN (C8) on.
Roller Blind Master	Master control for Shutters	C5/C6	Drives shutters B1/B2 and B5/B6 up or down.
Roller Blind Master	Master control for Shutters	C7/C8	Drives shutters B3/B4 and B7/B8 up or down.
Push button	Aux. Channel	D4	Auxiliary channel for avoiding double Up or Down commands for shutters.
Recycler	Generate random signal	D5..D8	Activated via change-over switch C1.

The logic set-up looks as follows:

Logic block number				
Output	**Input 1**	**Function**	**Input 2**	**Notes**
W1	D5	AND	D6	Random marker "UP"
W2	D7	AND	D8	Random marker "DOWN"
D4	-D4	AND	W1	Enable condition for aux. Channel
D4	D4	AND	W2	Disable condition for aux. Channel
C3	\D4	OR	\D4	Master ON via aux. Channel
C4	/D4	OR	/D4	Master OFF via aux. Channel
C5	/D4	OR	/D4	Shutters "UP" via aux. Channel
C6	\D4	OR	\D4	Shutters "DOWN" via aux. Channel

Here, too, there are numerous possibilities of varying and extending the application. As a suggestion, consider time for example switches or additional master controls. Give it a try!

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