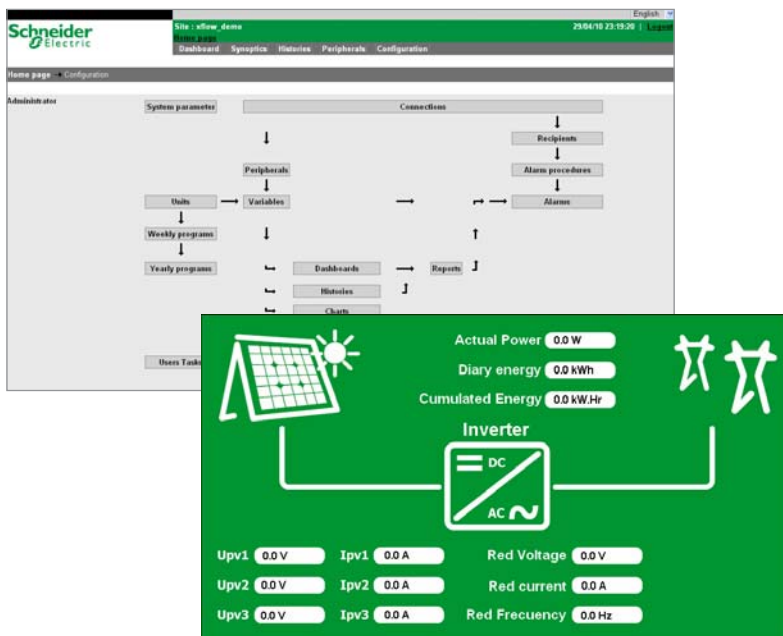


Xflow

Embedded remote management software
for iRIO and industrial PC platforms

User's manual



Chapter 1 General overview	4
Chapter 2 Functionalities	5
Chapter 3 Operating tools	11
Chapter 4 Configuration	20
Chapter 5 Operation	73
Chapter 6 Specific peripherals	81
Chapter 7 Maintenance	99
Chapter 8 Specific alert media	107
Chapter 9 Straton setup	113

Description

Xflow is an industrial remote management software which performs numerous functionalities.

This software can be embedded on various platforms such as Schneider Electric iRIO remote terminal units and industrial PCs.

Data acquisition

It allows reading and writing of data from/to various PLCs, controllers, input/output cards and sensors. It formats this data (scaling, counting of time, pulses, etc.).

Data historization

It establishes a history of the data in time tagged files, with the possibility of performing complex processing (operations, differential recording, state files).

Alarm management

It performs alarm detection based on complex conditions and criteria. It can then transmit these alarms to a large number of different media in accordance with call procedures with resumption and backup mechanisms.

Automatic controls

It provides local processing and automatic control functions, by means of calculation formulae associated with variables or alarms, or by using the Straton tool.

This tool allows the development, testing and deployment of applications complying with the IEC 61131-3 standard (the five programming languages of this standard are supported: SFC, FBD, LD, ST, IL).

Access to information

It allows access in operation and configuration modes to all data, remote and local, via any standard Web browsing software.

Xflow is supplied with a standard multilingual Web profile and offers a series of pages allowing complete configuration of the application, data presentation, and operation. For operation, the interface proposes an integrated synoptics editor, a dashboard system and the presentation of saved data in table or graph form.

However, the operating interface is fully adaptable for specific applications.

It also has various means for supplying the managed information to a central information system:

- Proprietary protocol: communication to remote management supervisors (Kerwin)
- "Pushing" of reports in CSV format (Excel) to an FTP server or as an email attachment
- A third-party system can obtain Xflow data by XML/SOAP polling.

Security

All accesses are protected by user/password. Each user has his own logon name and password and is associated with one of the four access levels (Consultant, Operator, Configurator or Administrator). If necessary, read/write rights can then be adjusted more precisely user by user.

The passwords never appear in natural language whether for Web connection (encryption with exchange of a different public key for each new session) or for storage in the database (encryption with private key).

Every session is automatically closed after 20 minutes' inactivity.

A different session number is created at each new Web connection to ensure that the user connected is still the same during a given session. This session number appears in encrypted form in the URL (Internet address field of the browser).

The banners associated with the services supported by the Xflow Web server (e.g. http) have been eliminated. Banners allow information to be obtained concerning the programs installed in a computer.

All incoming calls on a local serial port or Ethernet port, or else on a remote port (modem), are traced in a file (logon time, logoff time, identifier, IP address or telephone No. (if the number's identifier function is enabled)).

By default, modem communications are not routed to the Ethernet interface.

Variables	6
History files	7
Alarms	7
User interfaces	7
Other functionalities	8
Capacity	9
IP communication flows	9

Variables

Xflow characterizes the variables that it manages by numerous criteria. Accordingly, it is possible to associate specific types of behaviour and/or functionalities with them.

First of all, it defines a variable by its type. This may be a DIGITAL input or output, an ANALOGUE input or output or a COUNTER (time or pulse).

It then adds the concept of virtual variable, system variable and peripheral variable.

- A virtual variable represents an immaterial variable for which the type and behaviour are defined.

- A system variable is a variable providing information on the Xflow software and its internal mechanism.

- A peripheral variable is a variable located on a peripheral to which one is connected.

In order to communicate with various **peripherals**, the Xflow software has numerous drivers frequently used by the manufacturers (Modbus, ModbusTCP, Unitelway, Trend, TAC, OPC Client – only on PC platforms –, RVL, Xantrex, SunEzy, etc.).

For known peripherals (irrespective of the protocol used), it is possible to pre-describe their variables in the Xflow software. This means it is possible, on the one hand, to shorten configuration times while increasing its reliability and, on the other hand, to provide occasional direct access to the variables of a pre-described peripheral, without having to declare them explicitly.

For each variable managed by Xflow it is possible to apply a calculation formula. For example, when the variable is modified or evaluated, the value available corresponds to the value recently calculated with the corresponding formula.

When a variable is evaluated, it is possible to define for it the execution of an operation (in the same way as calculation formulae). These operations are varied: slope, mask, differential, pulse, smoothing, filtering, etc.

The difference between a formula and an operation lies in the very concept of the existence of the variable. An operation is used to adjust the raw value of the variable whereas a formula is used to define its value.

An important criterion regarding variables is the storage format. Xflow offers a broad choice of data formats:

- boolean,
- byte, int 8,
- int 16, int 32,
- word, dword,
- IEEE, DIEEE,
- time and string.

Xflow permits the definition of a refreshment period for the variable. This means that after this period, the variable is evaluated again.

This refreshment time is configurable according to several units of time: *automatic mode, milliseconds, seconds, minutes and hours*.

Finally, Xflow provides a Plug and Play functionality for the input/output cards of the RIO series (automatic detection of their variables).

History files

Xflow is capable of establishing history files which can have several uses.

A history can be established to perform monitoring of variable measurements (up to 50 per file):

- Recording period for n variables
- Recording of variations of variables
- Recording controlled by calculation formula.

When creating a measurement history, Xflow allows the user to choose the minimum recording period, the scale of which starts with the second and ends with the month. It also adds to this the review concept so as to obtain a precise summary (min., max., average, time at 0 and > 0, edge counter, difference, reset).

It proposes the establishment of histories of **incoming and outgoing calls**, an **events** history, and **status** histories. The latter allow very easy recording of changes of variables.

Each history corresponds to a file. The quantity of files managed depends on the hardware platform on which Xflow runs.

Alarms

Xflow allows the creation of alarms on various functional items so that the user may be informed of abnormal behaviour of Xflow or one of its peripherals.

It defines 4 causes of alarms and, in particular, of alarms on logic or analogue variables (one variable can have several alarms) and system alarms (at start-up and stoppage of the application, upon a peripheral failure, etc.).

Upon the appearance or disappearance of an alarm it is possible to execute a calculation formula.

An alarm can be time-delayed upon appearance and disappearance, have an hysteresis (for analogue alarms) or else have a time delay for response.

It can also exist to inhibit a behaviour.

When an alarm is tripped, it can be added as a recording in several event files and in an alarm file. It is also possible to ask Xflow to execute an **alarm procedure**.

This procedure involves informing a correspondent of the tripping of an alarm. Each procedure has up to 3 recipients to be called. Each "main" recipient can be backed up by 2 standby recipients in case of failure when calling the first one.

Xflow has several drivers which allow communication with a huge choice of recipients: Kerwin, SMS on GSM, e-mail, FTP, fax, TAP, etc.

User interfaces

Xflow has 2 user interfaces for its operation and configuration:

- The first one is a Web interface (under http protocol), accessible from any device having a Web browser (Internet Explorer or Firefox) such as a PC, Pocket PC, etc.: the embedded Web server in Xflow allows full configuration of the application and its operation with a number of controls and aids for the user.

This Web interface is accessible on Ethernet links, local serial interfaces if they are of the "full duplex" type (RS232), and the modem links (PSTN, GSM or GPRS) of the hardware platform on which Xflow runs.

- The second one is the Kervisu interface, which is a Schneider Electric configuration and operating tool running on PC. Kervisu communicates with Xflow by means of a proprietary protocol (Napbus). All Xflow data is presented in table form.

This interface is available on Ethernet links, local serial and modem links.

Other functionalities

Communications

Xflow manages various types of communication links: Ethernet, serial and modem links (Xflow is compatible with Hayes modems)

All the links are standardized and can be used:

- In Server (or slave) mode to allow user access or allow a remote system to obtain access to Xflow data (XML/SOAP, Modbus, ModbusTCP, Napbus)
- In Client mode to allow Xflow to obtain access to data of third-party devices under various protocols (PLC, Counters, Controllers, Photovoltaic Inverters, etc.).

The serial links support the PPP protocol to transport IP communications (Web over telephone link, for example).

Xflow also manages SMS's if the hardware on which it runs is equipped with a GSM modem.

- Xflow sends SMS's to mobile phones upon detecting an alarm, or to another Xflow (intersite function).
- Xflow receives SMS's from a mobile phone (a user can send a command to Xflow or acknowledge an alarm by returning to Xflow the alarm SMS that it has just received) or from another Xflow or else a BRIO/W310 (intersite function).

Users

The Xflow software adopts a group strategy to check the access rights of each user (user types are predefined).

Each user has his own logon name and password and is associated with one of the four access levels (Consultant, Operator, Configurator or Administrator). If necessary, read/write rights can then be adjusted more precisely user by user.

Development

The user can develop his application in various ways.

Calculation formulae: this is spoken of as application configuration rather than as development, because the user can configure his application from the Web interface using calculation formulae combined with the other basic Xflow services (variables, alarms, files, timetables, etc.): most of the remote management applications can be performed by this method accessible to non-specialists in automation or programming languages and requiring no external tool.

Use of a programming software environment allowing the development, testing and deployment of applications complying with the IEC 61131-3 standard (the five programming languages of this standard are supported: SFC, FBD, LD, ST, IL).

The third possibility is to develop tasks in C language

These tasks can use the Xflow resources (database, communication, etc.) to implement specialist applications. Once developed, these tasks can be downloaded and then launched and controlled by Xflow. This possibility is reserved for users having good IT development skills.

Capacity

Xflow manages its “storage memory” dynamically depending on the platform on which it is installed. The announced capacity and functions available can therefore vary depending on the commercial options chosen at ordering.

On an operating system such as Microsoft Windows for PC (2000, XP), Xflow is capable of managing up to 10,000 variables and 10,000 alarms, and the measurement files are limited to the size of the computer's hard disk.

On an operating system such as Microsoft Windows for mobile devices (CE), Xflow manages up to 2,000 variables and 1,000 alarms. The size of measurement files is limited to 2MB, although this memory can be extended by a storage card.

Summary

Tables	Hardware platform PC	iRIO SLXA DIVA-XA
Peripherals (1)	500	200
Links (2)	200	20
Variables	10 000	2000
Alarms	10 000	1000
Files (3)	100	50
Dashboards	50	50
Dial-up procedures	250	250
Call groups	50	50
Recipients	250	250
Reports (4)	8	8
Weekly programs	500	500
Yearly programs	500	500
Users	128	128

(1) Peripherals: any device communicating with Xflow: input/output card, counters, PLCs, inverters, controllers, etc.

(2) Links: communication channel with a peripheral, like a serial port, a TCP connection etc.

(3) Files: allow storage and time tagging of the information acquired and formatted by Xflow. There are various types of files. Among these are measurement files which can record and time tag up to 50 variables per measurement file.

(4) Reports: service allowing Xflow data to be sent in CSV file form (Excel-compatible format). The reports are sent by Xflow to an FTP server or as an e-mail attachment.

IP communication flows

This section summarizes all the communications via Internet protocols used by Xflow, specifying the IP ports used.

IP ports on which Xflow is listening: these are all the applications for which Xflow is server.

Application	IP port	Transport protocol	Possible clients
Napbus	32136 (fixed)	UDP	Kervisu, Kerwin
Web (http)	80 (configurable)	TCP	Browser, SOAP application
ModbusTCP	502 (fixed)	TCP	Schneider ModbusTCP Master hardware
Straton	1100 (configurable)	TCP	Straton software environment

IP ports of applications used by Xflow in client mode

Application	IP port	Transport protocol	Possible servers
Modbus	(configurable)	UDP	Another Xflow
Modbus	(configurable)	TCP/UDP	A Modbus slave device on Ethernet (Modbus encapsulated in TCP or UDP)
Modbus_TCP	502 (configurable)	TCP	ModbusTCP slave PLCs (Schneider, etc.)
Email	25 (configurable)	TCP	SMTP server
FTP commands	21 (configurable)	TCP	FTP server
FTP data	20 (default or negotiated automatically)	TCP	
DNS	53 (outgoing), 32153 (DNS PPP response), 42153 (DNS Ethernet response)	UDP	DNS servers (address resolution: allows the use of a domain name – to obtain access to an email server, e.g. ftp – rather than an IP numeric address)

How to communicate with Xflow	12
Use of Kervisu on the local terminal port	12
Connecting Xflow to the PC	12
Creating a link	13
Creating a peripheral	13
Connecting Kervisu with Xflow	13
Using Kervisu via modem	14
Creating a modem link	14
Creating a peripheral	14
Connecting Kervisu with Xflow	14
Using a Web browser with a PC Windows NT or 2000	14
In local connection via serial link (RAS protocol)	14
Create a standard modem	14
Create a remote network access	15
Logging on	15
To log off	15
In remote network connection by modem link	16
Create a remote network access	16
Logging on	16
To log off	16
In IP connection by Ethernet link	16
Using a Web browser with a PC Windows XP	17
In local connection via serial link (RAS protocol)	17
Create a standard modem	17
Create a remote network access	18
Logging on	18
To log off	18
Automatic communication stoppage	18

How to communicate with Xflow

Communication with Xflow is accessible:

- Locally on the terminal port
- Remotely on the Modem port
- In Ethernet network on the network port.

The PC (or PDA) must be provided with either a Web browser or the Kervisu software.

Using Kervisu, the communication protocol is Napbus, a proprietary extension of the Modbus protocol. In this case, after installing Kervisu, simply check the availability of serial and/or modem ports.

To log on to Xflow with a Web browser, the HTTP protocol is used. In this case, you must log on to Xflow with a standard remote network connection, similar to those used to establish an Internet connection. For remote access, the communication resources of your Windows operating system are used (you must use an existing modem or add a new one).

For local connection (serial, RS232, 115200 bps), the same Windows resources are used, but in addition, you must declare a "fictitious" modem on one of the serial ports of your PC, **to which a real modem must not be connected**: this trick means it is possible to avoid using direct PC-to-PC connections, which are not always available and functional depending on the operating system.

NB: under Windows 2000 and XP, but not with PDAs.

For PCs that have only USB ports, a USB-serial converter is needed.

For local serial connections, the same cables are used whether it be a Kervisu or a Web browser.

Use of Kervisu on the local terminal port

Connecting Xflow to the PC

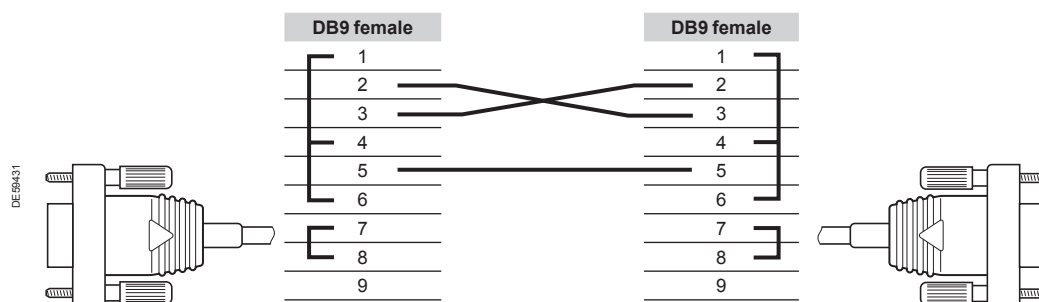
To be able to communicate between Kervisu and Xflow, there are various ways of proceeding depending on the platform on which Xflow is running.

Xflow on a PC

To connect Xflow in execution mode from a Client PC on a PC, you must use the Web interface (via a Web browser) or else Kervisu on an IP link (Xflow is receptive on UDP port 32136).

Xflow on an iRIO

To connect Xflow in execution mode on an iRIO platform to a PC, you must use a specific Schneider Electric Telecontrol serial cable having the reference: 0RIOKIRPC000.



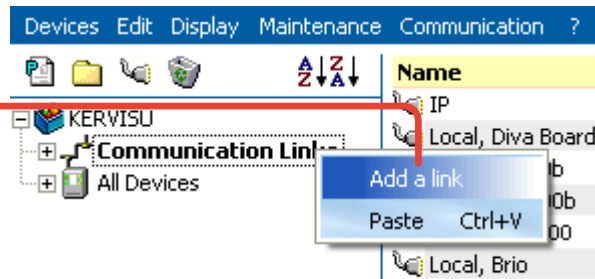
Specific Schneider Electric Telecontrol iRIO cable (female <-> female)

This cable is similar to the null modem cable (female <-> female) except that the RTS and CTS signals are inhibited (pins 7 and 8 shunted) and the DCD signal is forced to 1 (pins 1, 4 and 6 shunted). In addition, the shunts are present on each DB9 female (the cable must be symmetrical, because the two connectors are identical (DB9 female)).

Link1017	
Properties	Value
Connection	
Type	Local
Characteristics	
Name	Local iRio
Timeout response (ms)	5000
Communication Port	COM1
Speed	115200
Format	8 bits no parity
Confirm Quit	

Creating a link

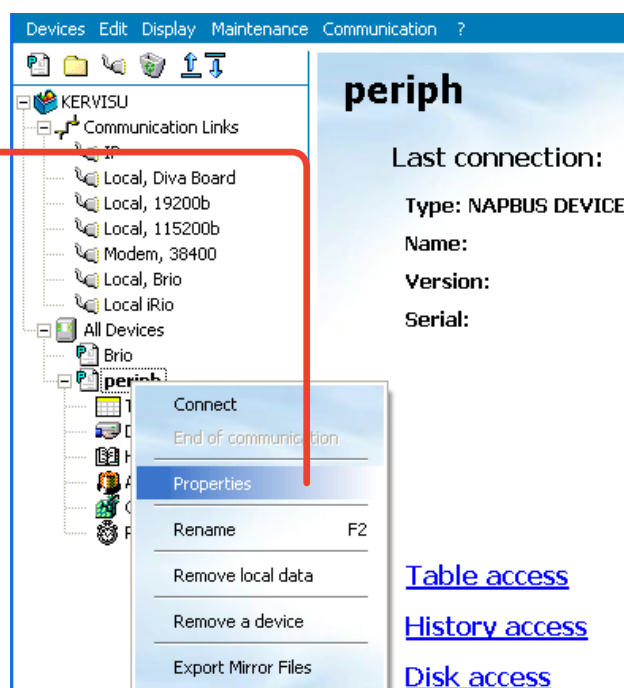
Right click on "links" and then configure according the model



Creating a peripheral

Right click on "periph"

Periph	
Properties	Value
Identification	
User Name	TEST
Password	****
Memorize Password	Yes
Parameters	
Device Name	iRio
Device address	10
Connection	Extended Modbus
Link Type	Local iRio
Phone	
IP Address	
Diva Option	
International Call	
Country Code	
Local Code	
Make an International call	No
Information	
Installation Type	
Client's Name	
Localisation	
Technician's Name	
Technician's Telephone No	
Send Offline Modifications	
Send Modifications	No
Mobile Phone Number	
Email Address	
Confirm Quit	

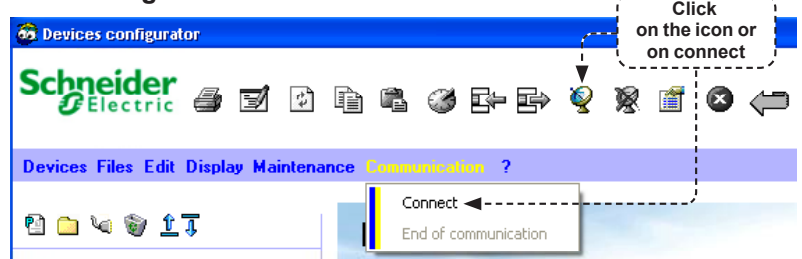


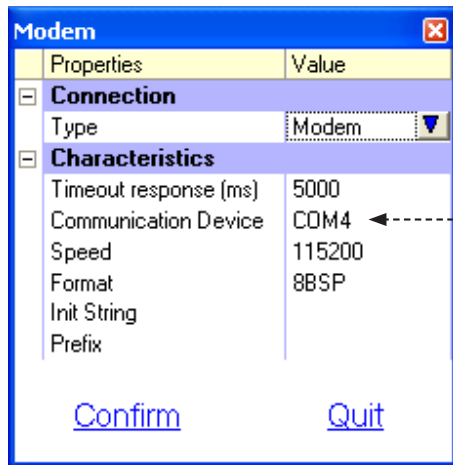
User name	TEST
Password	TEST
Device name	At your choice (name of site)
Device address	Default value
Connection	Choose Extended Modbus
Link type	From the list, choose the pre-configured link

Then Confirm

Note: Xflow is supplied by default with a user already configured (name: TEST; password: TEST). It is recommended to change it after the first connection.

Connecting Kervisu with Xflow





Using Kervisu via modem

Creating a modem link

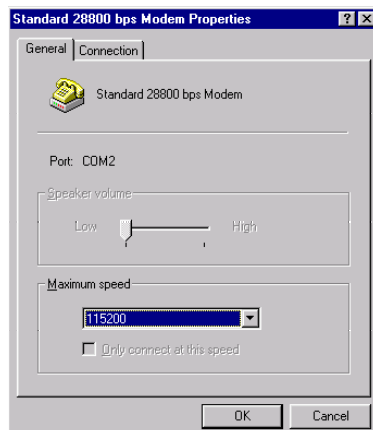
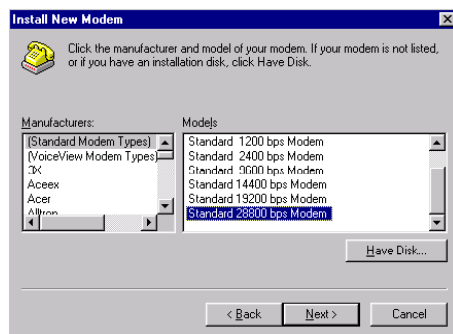
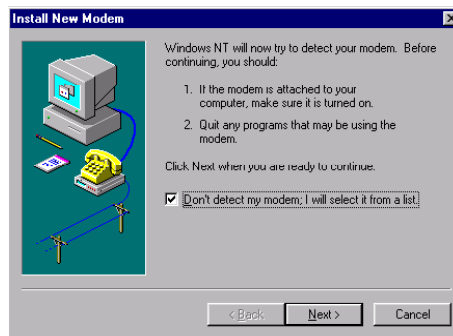
Proceed as though creating a local link, then configure according to the model:

Creating a peripheral

Proceed as for a local peripheral
Enter the telephone No. of the Xflow computer.

Connecting Kervisu with Xflow

Proceed as for a local peripheral.

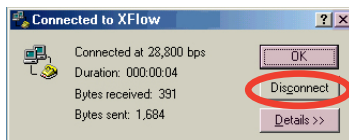
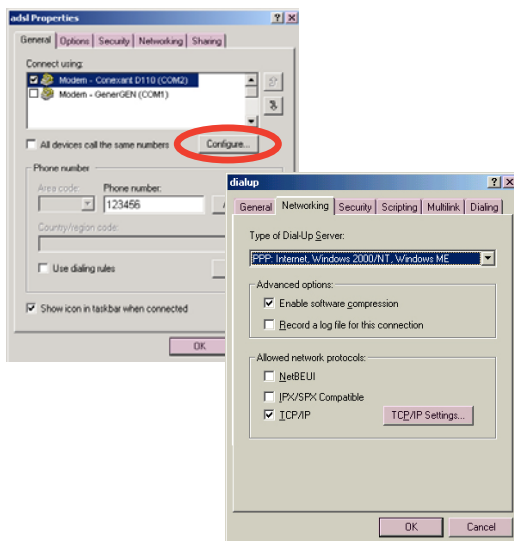
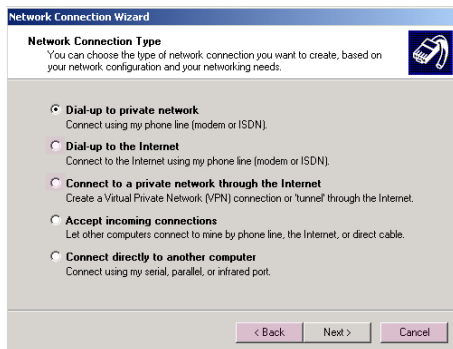


Using a Web browser with a PC Windows NT or 2000

In local connection via serial link (RAS protocol)

Create a standard modem

- Start Menu
 - Parameters
 - Control panel
 - Phone and modem options
- Opening of the phone and modem options window
- Modems tab
 - Add
- Opening of the Wizard
 - ☐ Check "Don't detect my modem; I will select it from a list" → [Next >]
- Select from the drop-down lists
 - ☐ Manufacturers: Standard modem types
 - ☐ Modem types: Standard 28800 bps Modem → [Next >]
- Select the communication port for local connection → [Next >] [Terminate]
- Select the modem configured
 - Properties
- General tab
 - ☐ Select 115200 bps for the maximum speed
- Advanced tab
 - ☐ Change default preferences
- Port speed: 115 200
- Select "None" for flow control → [OK]
- Close the "Modem Properties" window → [OK]
- Close the "Phone and Modem Options" window " → [OK]



Create a remote network access

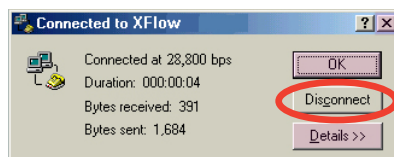
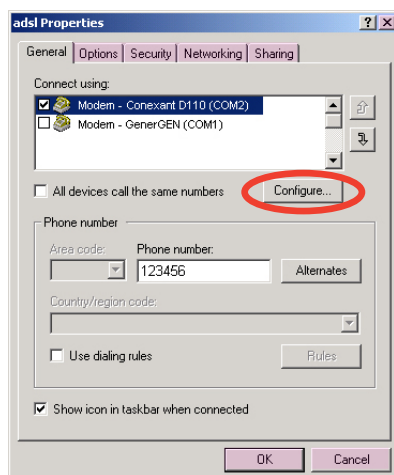
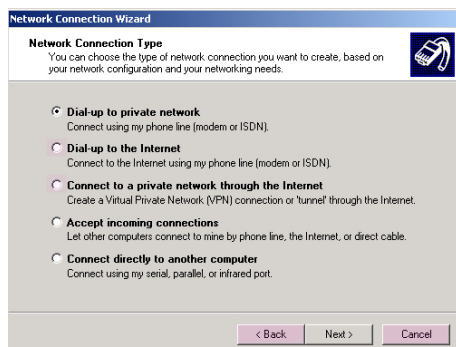
- Start Menu
 - Parameters
 - Control panel
 - Network connections and remote access
- Establish a new connection → [Next >]
- Opening of the Wizard → [Next >]
- Check Connection to a private network → [Next >]
- Choose the standard modem determined previously → [Next >]
- Enter any phone number (for example: 12345) → [Next >]
- Select connection availability (for example: only for me) → [Next >]
- Name the connection (for example: local Xflow) → [Terminate]
- Opening of the Connection window
 - Enter the user Name and password
 By default, user Name = TEST and password = TEST
 - Properties
- General tab → [Configure]
 - Hardware characteristics
- Check the speed: 115 200 bps
- Deselect "Activate hardware flow control" → [OK]
- Close the Properties window
- Network Management tab
 - Check only "TCP IP protocol"
 - Select "parameters"
 - Check: activate LCP extensions
 - Check: activate software compression
- Dialling.

Logging on

- Once connection is established, an icon appears in the task bar (in the bottom right-hand)
- Start the Web browser
- Enter the IP address of the device (by default: 172.16.1.250).

To log off

To close the Xflow application, simply quit (in the top right-hand) Xflow. Then, cut off the connection by clicking on the icon (in the bottom right-hand) in the task bar and [log off].



In remote network connection by modem link

To establish a remote network connection, you must connect your computer to the telephone network and proceed as follows. Also check that the device is connected to a telephone line.

Create a remote network access

- Start Menu
 - Parameters
 - Control panel
 - Network Connections and remote access
- Establish a new connection → [Next >]
- Opening of the Wizard → [Next >]
- Check Connection to a private network → [Next >]
- Enter the phone number of the facility (for example: 0123456789) → [Next >]
- Select connection availability → [Next >]
- Name the connection (for example: remote Xflow) → [Terminate]
- Opening of the Connection window
 - Enter the user Name and password
 - By default: user Name = TEST; Password = TEST
 - Properties
- General tab → [Configure]
- Select 115200 bps for the maximum speed
 - Hardware characteristics
- Check "Activate hardware flow control" → [OK]
- Close the Properties window
- Network Management tab
 - Check only "TCIP protocol"
 - Select "parameters"
 - Check: activate LCP extensions
 - check: activate software compression
- Dialling.

Logging on

- Once connection is established, an icon appears in the task bar (in the bottom right-hand)
- Start the Web browser
- Enter the IP address of the device (by default: 172.16.1.250).

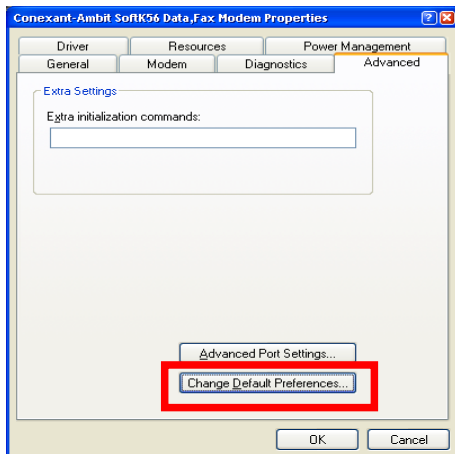
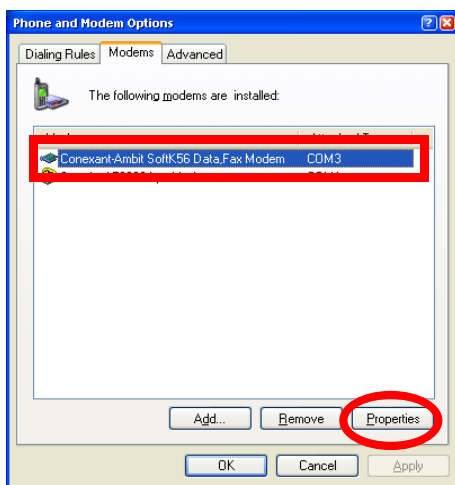
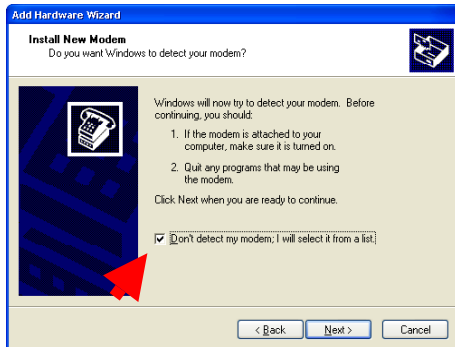
To log off

To close the Xflow application, simply quit (in the top right-hand) Xflow. Then, cut off the connection by clicking on the icon (in the bottom right-hand) in the task bar and [log off].

In IP connection by Ethernet link

- Connect the PC to the RJ 45 connector of the Xflow platform (iRIO, industrial PC, etc.) either directly using a cross cable (a straight cable can also work if the Ethernet interface of the PC supports self-detection), or on an Ethernet network.
- Enter the IP address of iRIO in the address bar of the Web browser (By default: 172.16.1.250).

Comment: for the Ethernet connection to be able to be established, the IP address of the PC must be either compatible with that of Xflow (same addressing range or else routing by a network device, etc.). For example, change the address of your PC to 172.16.1.1.



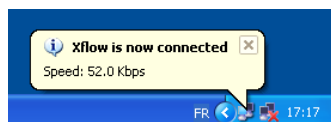
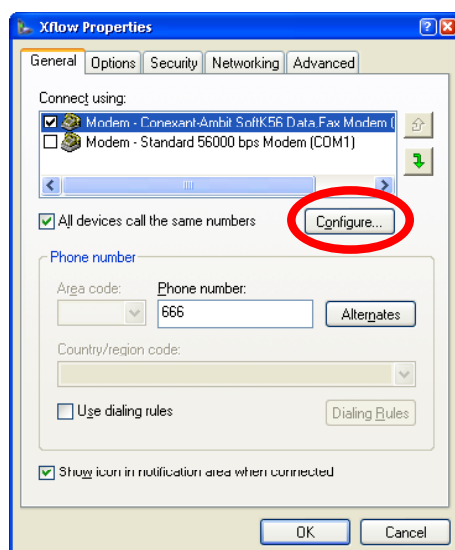
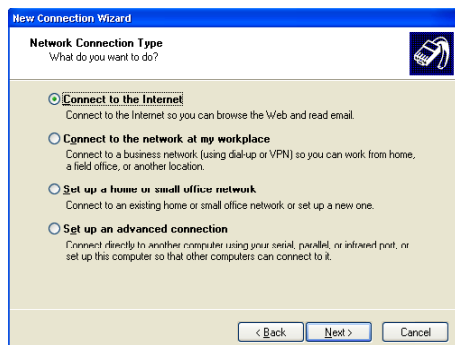
Using a Web browser with a PC Windows XP

In local connection via serial link (RAS protocol)

To establish a local connection, you must connect your computer to the front panel (DB9 connector) of the device present in your facility.

Create a standard modem

- Start Menu
 - Parameters
 - Control panel
 - Phone and modems options
- Opening of the Phone and Modem Options window
- Modems tab
 - Add
- Opening of the Wizard
 - ☐ Check "Don't detect my modem; I will select it from a list" → [Next >]
- Select from the drop-down lists
 - ☐ Manufacturer: Standard modem types
 - ☐ Modem types: Standard 56000 bps Modem → [Next >]
- Select the communication port for local connection → [Next >]
[Terminate]
- Select the modem configured
 - Properties
- Modem tab
 - ☐ Select 115200 bps for the maximum port speed
- Advanced Settings tab
 - ☐ Change default preferences
- Port speed: 115 200
Select "None" for flow Control → [OK]
- Close the "Modem Properties" window → [OK]
- Close the "Phone and modem options" window → [OK].



Create a remote network access

- Start Menu
 - Parameters
 - Control panel
- New Connection Wizard connections
- Establish a new connection → [Next >]
- Opening of the Wizard → [Next >]
- Check local area connection → [Next >]
- Check remote access connection → [Next >]
- Choose the standard modem determined previously → [Next >]
- Name the connection (e.g. local Xflow) → [Next >]
- Enter any phone number (e.g. 12345) → [Next >]
- Select connection availability (e.g. for me only) → [Terminate]
- Opening of the Connection window
 - Enter the User name and password
 - By default, User name = TEST and password = TEST
 - Properties
- General tab → [Configure]
 - Hardware characteristics
 - ☐ Check the speed: 115 200
 - ☐ Deselect "Activate hardware flow control" → [OK]
- Network Management tab
 - ☐ Leave checked: TCP/IP protocol
 - QoS packet scheduler
 - ☐ Deselect the other components.
- Close the Properties window
- Dialling.

Logging on

- Once connection is established, an icon appears in the task bar (in the bottom right-hand).
- Start the Web browser
- Enter the IP address of the device (by default: 172.16.1.250).

To log off

To close the Xflow application, simply quit (in the top right-hand) Xflow. Then, cut off the connection by clicking on the icon (in the bottom right-hand) in the task bar and [log off].

In IP connection by Ethernet link

- Connect the PC to the RJ 45 connector of the Xflow platform (iRIO, industrial PC, etc.) either directly using a cross cable (a straight cable can also work if the Ethernet interface of the PC supports self-detection), or on an Ethernet network.
- Enter the IP address of iRIO in the address bar of the Web browser (By default: 172.16.1.250).

Comment: for the Ethernet connection to be able to be established, the IP address of the PC must be either compatible with that of Xflow (same addressing range or else routing by a network device, etc.). For example, change the address of your PC to 172.16.1.1.

Automatic communication stoppage

For security reasons, the Xflow software incorporates an automatic communication stoppage function, which can, in particular, prevent Xflow from remaining in telephone communication mode because an operator has forgotten to perform the log off procedure.

This function is based on a connection timeout of about 5 minutes; this corresponds to the maximum time available to you between two actions.

Methodology	22
Configuration tools	22
Web configuration (with a Web browser)	22
General principles of browsing	23
Add a connection, a variable, etc.	23
Go to the following stages of configuration	23
Confirm a configuration	23
Advanced settings	23
Confirm a configuration and go to the next one	23
Locking	23
Delete a configuration	23
Navigating within a list	23
Refreshing a page	23
Dynamic control	24
Connections	25
Introduction	25
Dynamic control of links	25
Details of link parameters	26
Peripherals	28
Introduction	28
Dynamic control of peripherals	28
Details of peripheral parameters	29
Variables	30
Introduction	30
Dynamic control of variables	30
Details of variable parameters	31
Histories	36
Introduction	36
Dynamic control of histories	36
Details of history parameters	37
Configuration of a measurement or state file	38
Alarm recipients	40
Introduction	40
Dynamic control of a recipient	40
Availability of a recipient	41
Configuration of a recipient	42
☐ Beeper (call by modem)	43
☐ Kerwin (call by modem)	43
☐ FTP	43
☐ MAIL	43
☐ Serial printer (on serial link only)	44
☐ GSM SMS (with GSM modem only)	44
☐ TAP (7bitspp) (GSM SMS and EXPRESSO with or without subscription)	44
☐ TAP AGCOM (GSM SMS and EXPRESSO with subscription)	44
☐ SMS or Pager via Teletel servers (in France)	45
☐ Flowtel/Teleflo, Intersites, Kerwin PPP, Fax, Kerwin SMS, PCText	45
Syntax of a message (meta field)	45
Alarm procedures	46
Introduction	46
Dynamic control of a procedure	46
Configuration of a procedure	46
Alarms	47
Introduction	47
Dynamic control of alarms	47
Configuration of an alarm	47

Weekly programs	50
Introduction	50
Dynamic control of weekly programs	50
Configuration of a weekly program	50
Assignment of weekly program to the variable	51
Deletion of a time slot and a weekly program	51
Example	51
Yearly programs	52
Introduction	52
Dynamic control of yearly programs	52
Configuration of a yearly program	52
Deletion of yearly time slots and yearly programs	53
Example	53
Dashboards	54
Introduction	54
Configuration of a dashboard	54
Synoptics	55
Introduction	55
Configuration of a synoptic	55
Advanced settings	56
Introduction	56
User settings	56
Unit settings	56
□ Multi-state logical units	56
Configuration of filters on incoming calls	57
Configuration of Modbus addresses	57
System settings	58
□ System information	59
□ System commands	59
□ Database	59
Calculation formulae	60
Introduction	60
Syntaxes and rules	60
Operands	60
Operators	61
Functions	63
□ Mathematical functions	63
□ Trigonometric functions	63
□ Statistical functions	64
□ Logical functions	64
□ Time functions/Dates and times	65
Other functions	66
Advanced functions	67
Reports	68
Introduction	68
Configuring a report	68
User tasks - Table of tasks	71

Configuration tools

Xflow can be configured either using a Web browser (IE7 or Firefox, for example) via the Web interface, or using the Kervisu software, or through a combination of both. It is recommended to start configuration with the browser, and if need be use Kervisu for its “Copy and Paste” and “Insert/Delete lines” functions which simplify configuration in the case of applications with a very large number of variables.

Using Kervisu:

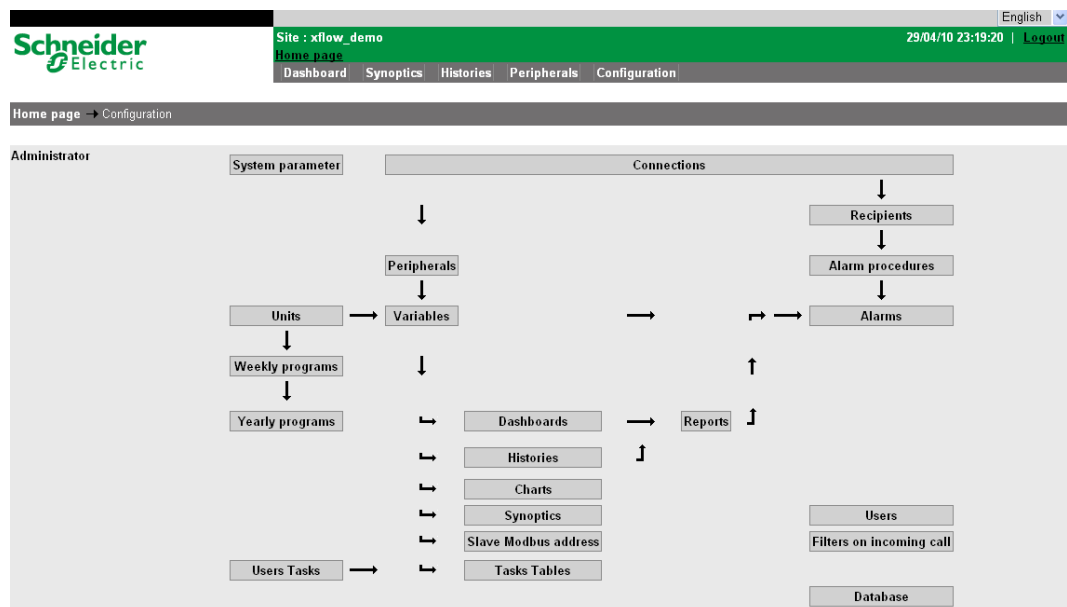
- Backup of the Xflow configuration on a PC
- Configuration cloning: the configuration of an Xflow can be used as a model for a new site. *See Chapter 3 “Operating tools”.*

Web configuration (with a Web browser)

To configure an Xflow, it is recommended to comply with a certain logical order.

The order that we recommend is as follows:

- 1 Configure connections (communication ports, modems)
- 2 Configure peripherals (input/output cards, PLCs, controllers, etc.)
- 3 Configure units
- 4 Configure variables (Inputs/Outputs)
- 5 Configure histories (recording of measurements, alarms and connections)
- 6 Configure the recipients of alerts (entities called in case of alert)
- 7 Configure the alert procedures (sequences of calls to one or more recipients)
- 8 Configure alarms (an alarm can trigger a call mechanism and be saved in a dedicated file)
- 9 Configure programs (weekly, and then yearly, for automatic time-domain control of output variables)
- 10 Configure dashboards (synthetic representation of the instantaneous states of variables)
- 11 Configure synoptics (representation against a graphic background of the instantaneous states of variables)
- 12 Configure system settings (advanced configuration: passwords, site name, etc.).



⚠ The current configuration is saved automatically every 5 minutes. Between 2 backups, an electric power outage could cause the loss of the parameters configured since the last backup. It is possible to ask for immediate backup by selecting: *Configuration → System parameter → System control → Save configuration.*

Configuration

General principles of browsing

Add a connection, a variable, etc.

After selecting the parameter to be configured in the **[Configuration]** menu (Links, Variables, Alarms, etc.), a list appears. It corresponds to the items already configured.

To add a new parameter, click in the bottom left-hand of the page on:



Go to the following stages of configuration

To add a new parameter, click in the bottom right-hand of the page on:



⚠ Avoid using the "Previous" and "Next" buttons of the browser so as to clearly confirm your choices.

Confirm a configuration

⚠ To terminate, confirm and store in memory a configuration, click in the bottom right-hand of the page on:



Advanced settings

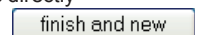
In some cases (e.g. peripherals), actuation of **finish** has the effect of configuring with advanced settings by default.

This is sufficient in most cases. To change or optimize the default settings, click on:



Confirm a configuration and go to the next one

To avoid returning to the menu it is possible to go to the next one directly by clicking in the bottom right-hand of the page on:



Locking

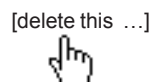
To prevent unwanted alarms during parameters setup and any phone calls to operators on standby, it is possible to lock peripherals, alarms, variables, files, recipients, etc.



⚠ Make sure to [unlock...] before starting the facility.

Delete a configuration

Display the list of parameters (e.g. links), select the one that you want to delete and click in the bottom left-hand of the page on:



⚠ A deletion is authorized only when no link exists on the parameter in question. For example, a link already used by a peripheral may not be deleted. The peripheral will have to be deleted first. In the same way, a variable linked to an alarm may not be deleted. The alarm will have to be deleted first. A record may not be deleted either before having been deactivated.

Navigating within a list

To go from one page to another, click in the top right-hand of the page on:



Refreshing a page

After an item has been changed, the page will be refreshed only after a "manual" action by the user on the browser Refresh button, or on the F5 key of the keyboard.



Configuration

General principles of browsing

Dynamic control

The home page for each parameter (links, peripherals, variables, etc.) allows dynamic control of the state and instantaneous value of all the parameters represented in list form.

For example: Variables

The screenshot shows the 'Variables' configuration page in the Schneider Electric Xflow interface. The page header includes the Schneider Electric logo, site information (Site : InterSolar), date and time (04/05/10 23:52:58), and a Logout button. The navigation bar shows 'Home page', 'Configuration', and 'Variables'. The main content area displays a table of variables with columns for #, Status I/O, Variable, Description, and Value. The table lists 17 variables, including PTR_SURVEIL, PTR_NB_DEFAULTS, PTR_VALUM, PTR_16DIO_5, PTR_16DIO_6, PTR_16DIO_7, PTR_16DIO_8, PTR_16DIO_9, PTR_16DIO_10, PTR_16DIO_11, PTR_16DIO_12, PTR_16DIO_13, PTR_16DIO_14, PTR_16DIO_15, PTR_16DIO_16, PTR_16DIO_1_b, PTR_16DIO_1, and PTR_16DIO_2. The status column shows icons for locked, in alarm, and in error. The value column shows the instantaneous values of the variables. Callouts explain the status icons, the selection filter, and the instantaneous values.

#	Status I/O	Variable	Description	Value
0		PTR_SURVEIL	Electrotechnical equipments monitoring period	Stop
1		PTR_NB_DEFAULTS	Active defaults number	5.00
2		PTR_VALUM	UPS2 Power Supply voltage	Normal
3		PTR_16DIO_5	Temperature 1st threshold transformer (Alarm)	Normal
4		PTR_16DIO_6	Temperature 2nd threshold transformer pressure (Activation)	Normal
5		PTR_16DIO_7	Spare	Normal
6		PTR_16DIO_8	Spare	Normal
7		PTR_16DIO_9	RM6 earthing switch position	Opened
8		PTR_16DIO_10	RM6 circuit-breaker position	Closed
9		PTR_16DIO_11	RM6 activation on HTA fault	Normal
10		PTR_16DIO_12	Batteries working	Yes
11		PTR_16DIO_13	Batteries weak level	Fault
12		PTR_16DIO_14	Batteries fault synthesis	Fault
13		PTR_16DIO_15	Spare	Normal
14		PTR_16DIO_16	Spare	Normal
15		PTR_16DIO_1_b	RM6 opening command	Neutral
16		PTR_16DIO_1	RM6 opening command	Neutral
17		PTR_16DIO_2	24Vdc power command (pulse)	On

Callouts:

- Status:**
 - Locked
 - In alarm
 - In error
- Selection of items to be displayed** (for variables, for example: selection according to number, name, status or else by peripheral)
- Instantaneous values of variables**

Introduction

The connections define the Xflow communication ports (modem, RS232/485 serial port, Ethernet port, etc.). They allow data interchange with the connected peripherals (input/output card, PLC, etc.), alarm media (Kerwin station, SMS, E-Mail, etc.) or configuration and operating tools (Kervisu, PC, etc.).

⚠ The devices are supplied pre-configured, so that all the links available on the device containing Xflow are already parameterized.

Dynamic control of links



Site : xflow_demo

29/04/10 23:23:37 | [Logout](#)

[Home page](#) | [Dashboard](#) | [Synoptics](#) | [Histories](#) | [Peripherals](#) | [Configuration](#)

Home page → Configuration → Connections

Status	Name	Type	Incoming protocol(s)
	ETH_TCP_INV1	TCP	No
	ETH_TCP_INV2	TCP	No
	RS485-1	Local serial line	No
	Modem	Local modem	napbus PPP

[add a connection]

Status

 Link busy

 Link connected

 Incoming call

 Modem in error

 Initialization failure

Details of link parameters

Name	Names the link by customizable title (maximum of 20 characters). Define a clear name allowing unambiguous identification of this link for the remainder of configuration. By default, the name is of the form RES000xx.		
Status		Link busy	The link is currently being used
		Link connected	The link is connected. The modems have "latched" with one another
		Incoming call	A ringing tone has been detected on the phone line (only if the link type is "Local modem")
		Modem in error	The modem has not replied to the initialization Hayes commands (only if the link type is Local modem or GSM). If the link type is GSM modem, the Modem status may be in error for the following additional reasons: ■ No SIM card ■ Incorrect PIN code ■ SIM card blocked.
		Link not initialized	Link initialization has not been performed correctly. The link is unusable. On Xflow PC, check that the communication port associated with the link is not already used by another application.
Type	■ Local serial: RS232/485 serial port of the device (refer to the hardware documentation). If a modem is connected to the serial port, the link should be of the local modem type. ■ Local modem: internal modem or modem connected to a serial port ■ Local GSM modem: internal GSM modem or modem connected to a serial port ■ UDP or TCP: available only on a device connected to an Ethernet local area network (Xflow on PC or iRIO). Both these types allow the TCP/IP to be protocol used on the local area network via the Ethernet connector of the device (generally use TCP).		
Incoming protocol	This concerns the links used for operation of Xflow (and not for communication with third-party cards or peripherals). It indicates which protocols are accepted in the event of an incoming connection: ■ Napbus: Schneider Electric protocol necessary in particular for the Kervisu configurator and the Kerwin supervisor ⚠ ■ PPP: protocol for logging on with a Web browser ⚠ ■ Minitel (Videotex protocol): to log on with a Minitel or a Minitel emulator (Kermin32). NB: keep at least one protocol. Incorrect configuration may make your device unconnectable. If in doubt, keep the original configuration. Comment on Videotex access This access does not allow configuration of Xflow, but only its operation (access to dashboards, peripherals and files, acknowledgement of alarms). The Kermin32 emulator must be the 4.02.0009 release or higher (the Kermin32 release number is obtained by a right-click on the Kermin32.exe file and then Properties/ Release).		
Port	Only for local serial, local modem or local GSM modem type links. Communication port used by the link. The list of communication ports depends on the number of ports on the local unit. iRIO comprises 4 serial ports: ■ COM1: RS232 by DB9 connector on the front panel ■ COM2: port corresponding to the internal modem (PSTN or GSM/GPRS) ■ COM3: RS485 on backplane ■ COM4: RS485 on backplane. PC: the number of ports on a PC depends on its hardware configuration.		
Speed in rest	Only for local serial, local modem or local GSM modem type links, with at least one idle protocol selected. Specifies at what speed incoming calls take place. In the case of a local modem type link, the value corresponds to the maximum speed of modem connection (max. 57600). In the event of a connection problem (connection failure, loss of carrier wave, poor quality line, etc.), the idle speed can be reduced to ensure improved reliability of transmission. In the case of a local GSM modem type link, the idle speed should be 9600 bps.		

Electrical interface	<i>Only for local serial, local modem or local GSM modem type links, with at least one idle protocol selected.</i> ■ RS232/RS485: Specifies whether the link is of point-to-point type (RS232) or multipoint (RS485). ■ RS232 flux XON/RS232 flux XOFF Specifies whether the link should use software flow control in forced XON mode or in forced XOFF mode. ■ RS232 RTS Auto Specifies whether the link should use RTS/CTS hardware flow control. <i>Only on a PC</i> ■ RS485 auto Automatic RTS/CTS control by the operating system under which Xflow runs. ■ RS485 manual RTS/CTS control by Xflow.
Modem init string	<i>Only for local modem and local GSM modem type links.</i> Specifies the AT commands (Hayes modem) for modem initialization. Except in special cases due to the modem used, this field should remain empty.
Modem dialling type	<i>Only for local modem and local GSM modem type links.</i> Specifies the dialling system used by the modem, pulse code modulation or voice frequency. At present, the pulse code modulation system practically no longer exists.
Number of ringing tones	<i>Only for local modem or local GSM modem type links, with at least one idle protocol selected.</i> Indicates the number of ringing tones before the line is taken by Xflow..
PIN code	<i>Only for local GSM modem type links.</i> Indicates the PIN code relating to the SIM card inserted in the GSM modem. Make sure not to enter an incorrect code. ⚠ Three successive failures will block the SIM card!
Trace	Allows the data exchanged over the link to be saved to a file. This field MUST be on OFF. ⚠ This functionality is reserved for Schneider Electric technicians in order to solve setup problems.
Number of bytes received	Number of bytes received over the link since its configuration
Number of bytes sent	Number of bytes sent by the link since its configuration
Number of PIN code failures	<i>Only for local GSM modem type links.</i> Number of PIN code entry failures
SIM reference	<i>Only for local GSM modem type links.</i> Reference of the SIM card
GSM reception level (dB)	<i>Only for local GSM modem type links.</i> Level of reception of GSM frequencies in decibels.
Number of outgoing calls per day	<i>Only for local serial, local modem or local GSM type links.</i> Allows the total number of calls per day over this link to be limited (control of telephone billing). Reminder: the outgoing calls over a link are generated by the recipients of alarms using that link. When this number is reached, Xflow prohibits any further outgoing call. The outgoing calls counter is reset at midnight or upon a manual action (cf. "Cumulative total of outgoing calls per day" field). As soon as this counter is reset, outgoing calls are authorized again. If this field is left at 0 (default value), the number of calls over this link is not limited.
Cumulative total of outgoing calls per day	<i>Only for local serial, local modem or local GSM type links.</i> This field indicates the number of outgoing calls made in the current day. It is reset automatically at midnight or upon a manual action in the Web page associated with the configuration of this link.

⚠ The transmission format for incoming calls (Xflow slave or server) is fixed at 8 data bits, one stop bit, no parity.

Automatic detection of peripherals of the RIO series connected to a link:
Only for local serial type links.

- This function can be used to search for RIO cards communicating over a serial link (at 115200 bps or 9600 bps).
- If the peripherals detected are not already configured in Xflow, they are automatically created.
- To start the search on a link, go to the page of that link and click on:
[Search for peripherals].

Introduction

The term "Peripherals" designates the products supervised by Xflow:

- RIO input/output cards
- PLCs, controllers, counters, inverters or other third-party products.

A peripheral is connected on a link defined in the previous section.

⚠ The devices may have been supplied with pre-configured peripherals. These peripherals correspond to the input/output cards present in the original hardware configuration.

Dynamic control of peripherals

Quick search by
entering the number

Sorting of
peripherals

The screenshot displays the 'Peripherals' configuration page in the Xflow software. At the top, there's a navigation bar with the Schneider Electric logo and a site name 'InterSolar'. Below this is a breadcrumb trail: 'Home page → Configuration → Peripherals'. A search bar is present with the text 'Show peripherals with the status' and a dropdown menu. The main part of the page is a table with 20 rows of peripherals. Each row has a 'Status' column with an icon, a 'Name' column with a text label, and a 'Type' column with a device type. A legend at the bottom left shows three status icons: a lock for 'Locked', a bell for 'Alarm', and an 'X' for 'In error'. A dashed line connects the 'Quick search by entering the number' callout to the search bar. Another dashed line connects the 'Sorting of peripherals' callout to the dropdown menu. A third dashed line connects the 'Status' callout to the legend.

	Status	Name	Type
1	🔒	PTR_in alarm	RIO UPS-2
2	🔒	PTR_on error	RIO 16AI
3	🔒	PTR_locked	RIO 16DIO
4	🔒	PTR_RIO 16DIO@3	API Modbus RTU
5	🔒	PMaux1_PMB10	RIO UPS-2
6	🔒	AB1_RIO 16AI@17	RIO 16AI
7	🔒	AB1_RIO 4AI@21	RIO 4AI
8	🔒	AB2_RIO 4DO@22	RIO 4DO
9	🔒	AB2_RIO UPS-2@242	RIO UPS-2
10	🔒	AB2_RIO 16AI@33	RIO 16AI
11	🔒	AB2_RIO 4AI@37	RIO 4AI
12	🔒	AB2_RIO 4DO@38	RIO 4DO
13	🔒	AB3_RIO UPS-2@243	RIO UPS-2
14	🔒	AB3_RIO 16AI@49	RIO 16AI
15	🔒	AB3_RIO 4AI@53	RIO 4AI
16	🔒	AB3_RIO 4DO@54	RIO 4DO
17	🔒	AB4_RIO UPS-2@244	RIO UPS-2
18	🔒	AB4_RIO 16AI@65	RIO 16AI
19	🔒	AB4_RIO 4AI@69	RIO 4AI
20	🔒	AB4_RIO 4DO@70	RIO 4DO

[add a peripheral]

Status

🔒 Locked

🔔 Alarm

❌ In error

Details of peripheral parameters

Name	Names the peripheral with a customizable title. Define a clear name allowing unambiguous identification of this peripheral for the remainder of configuration. Choose a short name (maximum of 20 characters), without any space or punctuation characters. By default, the name is of the form DEV000xx.		
Status		Peripheral locked	Polling on this peripheral has been inhibited by the user
		Peripheral in alarm	The peripheral is declared non-operational by the system and goes to alarm
		Peripheral in error	Impossible to communicate with the peripheral. Check the wiring and the state of the associated link
Type	Specifies the type of peripheral that you want to define. The list proposes all the compatible peripherals. Select that which corresponds to the connected device. To have the details of each type, refer to Chapter 6 on peripheral drivers. Specific case of system : type: allows polling of the internal variables of Xflow.		
Address	Documents the address of the peripheral. This value depends on the peripheral's type and configuration. Refer to Chapter 6 on peripheral drivers to know the syntax and the permissible values.		
Connection	Indicates on which link the peripheral is connected. The list proposes the links configured in <i>the previous section</i> .		

In most cases, the remainder of peripheral configuration is performed automatically.

 **If in doubt, leave the default values.**

Communication speed	<i>Only on a local serial or local modem type link.</i> Sets the speed of communication with the peripheral (in bps)		
Communication parameters	<i>Only on a local serial type link.</i> Specifies the binary data format on the link (7 or 8 bits, even, odd, no parity). All communications take place with 1 stop bit.		
Electrical interface	<i>Only on a local serial type link.</i> Documents the electrical format of the link, RS 232 or RS 485. iRIO: 1 RS 232 on COM 1 by DB9 connector (front panel) 2 RS 485's on COM 3 and 4 (backplane)		
PARM interface	Generally not used except in some cases with 0RIO2COM communication cards; an application memo describes the operation and the associated configuration.		

The following parameters require a good knowledge of the peripheral's communication protocol.

 **If in doubt, do not change the default parameters**

Failure time delay	Maximum waiting time (in milliseconds) for the peripheral's response		
Number of failures	Maximum number of frame resends in case of failure. Beyond this, Xflow indicates 		
End-of-frame time delay	Waiting time before considering an end of frame (complete frame reception criterion)		
Grouping length	Maximum number of words that can be transmitted in a frame		
Grouping space	To improve the speed of transmission, Xflow can read non-adjacent words and read the value of several variables in a single frame. To use this option, it is essential that the peripheral supports the grouping of variables (refer to the peripheral's user manual). Example: consider four variables with the following addresses: Var 1: @ 10; Var 2: @ 11; Var 3: @ 12; Var 4: @ 15 Case 1: Grouping space = 2 & Grouping length = 256 @ Var 2 - @ Var 1 < Grouping space @ Var 3 - @ Var 2 < Grouping space @ Var 4 - @ Var 3 > Grouping space, therefore this variable can not be refreshed by the same frame. Xflow sends two frames to retrieve the datas Var 1, Var 2, Var 3 & Var 4: one frame for the variables Var 1 Var 2 & Var 3, and one frame for the variable Var 4. Case 2: Grouping space = 5 & Grouping length = 256 @ Var 2 - @ Var 1 < Space group @ Var 3 - @ Var 2 < Space group @ Var 4 - @ Var 3 < Space group The device can send up to 256 words, Xflow generates a single frame for variables Var 1, Var 2, Var 3 & Var 4.		
Number of frames	<i>These fields are not configurable.</i>		
Number of error frames	Documents the volume of data exchanged between Xflow and the peripheral.		
Error rate	 A growing number of errors indicates a malfunction of the facility (configuration error, wiring error, etc.).		

Introduction

The variables represent all the control data processed and recorded by Xflow.

The acquisition and control of these data are performed by various means:

- Sensors and actuators connected to the peripherals (RIO cards, PLCs, etc.)
- Calculation formulae executed by Xflow based on sensor data
- System data

The devices may have been supplied with pre-configured variables.

Dynamic control of variables

Quick search by entering the number

Sort by names (possibility of using * to select a group: e.g. Temp*)

Sort by status

Sort by peripheral

The screenshot shows the 'Configuration' > 'Variables' page in the Xflow web interface. The page has a top navigation bar with 'Home page', 'Synoptics', 'Histories', 'Peripherals', and 'Configuration'. The 'Configuration' tab is active. Below the navigation bar, there's a search bar and a dropdown menu for 'Variables'. The main table lists variables with columns for '#', 'Status', 'I/O', 'Variable', 'Action', and 'Value'. A dropdown menu is open for the 'Action' column, showing options like 'No1- Energie A', 'No1- Energie A', 'No2- System S', 'No2- Goal Stat', 'No2- Fault Stat', 'No2- Inverter St', 'Xantrex No2- PV State', 'Xantrex No2- Inverter Me', 'Xantrex No2- PV Voltage', 'Xantrex No2- Total PV Current', 'Xantrex No2- PV Power Filtered', 'Xantrex No2- Inverter Real Power', 'Xantrex No2- Grid Frequency', 'Xantrex No2- Power Tracking Enabled', 'Xantrex No2- Ground Current', 'Xantrex No2- Sell Hours on Actual Day', 'Xantrex No2- Sell Hours in Actual Week', 'Xantrex No2- Sell Hours in Actual Month', 'Xantrex No2- Sell Hours in Actual Year', and 'Xantrex No2- Sell Hours Since Commissioning'. A legend at the bottom explains the 'Type' column: 'Input' (blue arrow), 'Output' (green arrow), and 'Input/Output' (red arrow). A 'Status' section lists: 'Lock', 'Unlock', 'Enable control by formula', and 'Disable control by formula'. A 'Type' section lists: 'Input', 'Output', and 'Input/Output'. A 'Status' section lists: 'in signalization', 'in alarm', 'comm. error', 'bad configuration', 'locked', 'not refreshed', 'command by formula disabled', 'used in a formula', 'failure at formula build', and 'failure at formula execution'. A 'Value' section lists: '0.0 kWh', '0.0 kWh', 'initializing', 'Shutdown', '0', 'shutdown', 'Shutdown', '0.0 °C', '0.0 V', '0.0 A', '0.0 kW', '0.0 kW', '0.0 Hz', 'Off', '0.0 A', 'initializing', 'initializing', 'initializing', 'initializing', and 'initializing'.

Selection of all the variables on the page

Selection variable by variable

Action to be performed on the selected variables:

- Lock
- Unlock
- Enable control by formula
- Disable control by formula

Status: the complete list of statuses for a variable is given in the following section

Type

- Input
- Output
- Input/Output

Instantaneous values of variables

Details of variable parameters

Name	Names the variable with a customizable title. Define a clear name allowing unambiguous identification of the variable for the remainder of configuration. Choose a short name (maximum of 20 characters), with neither spaces nor punctuation characters nor characters representing an operator for calculation formulae. By default, the name is of the form VAR000xx. ⚠ Each name must be unique. No other variable, nor any other alarm, weekly program, nor any other yearly program, should have the same name, or else errors could be generated in the calculation formulae, because the formulae use the names in their syntax.	
Status		Variable locked Polling on this variable has been inhibited by the user
		Variable in alarm The variable has been assigned to an alarm which has been tripped (crossing of threshold or alarm state)
		Variable in error Impossible to communicate with the variable. Check the wiring and the state of the associated link.
		Configuration error An inconsistency has been detected in the variable's configuration
		Not refreshed The variable was not refreshed during the previous cycle. This state can be permanent if physical saturation of the system is reached (too many priority variables relative to saturation - i.e. acquisition periods too short by comparison with the total number of variables): to eliminate the problem, fill in the "acquisition period" field only when necessary; if this is not sufficient, these periods will have to be adjusted. This state can be merely transient if the variable belongs to a "slow" peripheral
		Variable referenced in at least one formula To view all the formulae referencing this variable, simply click on the link associated with this icon in the details of the variable
		Control by formula disabled Allows the variable to be placed in manual control; stoppage of automatic control to force a value or to perform operating tests
		Formula compilation error The formula is not correct (syntax, incorrect reference, etc.)
		Formula execution error The formula is correct, but an error occurred during its execution (illegal calculation, etc.)
		"Straton" variable This variable is used by the Straton application during execution
Description	Provides an extended description. Comment with a precise sentence which provides information on the nature and content of the variable. This description must be understandable by all those working on the system. (maximum of 512 characters).	
Peripheral	Indicates on which peripheral the variable will be read and/or written. The list proposes the peripherals configured in the previous chapter. Specific peripherals: ■ The virtual peripheral: the variable is not read physically on a peripheral but its value is calculated by a calculation formula. ■ The system peripheral: the value of the variable is documented from Xflow system data. These data do not correspond to physical reading on a peripheral but to internal information in the Xflow software (very seldom necessary).	
Channel	This field is present only in the case of a predefined variable: RIO card, MAD module or pre-described third-party peripheral. The choice of a variable is made from a list. Refer to Chapter 6 describing the selected peripheral.	
Address	Address of the variable in the peripheral: Decimal: write the value; Hexadecimal: write the value preceded by the h or \$ sign (e.g. h3A5E or \$3A5E) This field is present only in the case of a peripheral that is not described. Syntax: depending on the peripheral (see Chapter 6).	
Reading format	To be filled in if the peripheral is not self-described. Format of the value to be retrieved in the peripheral. Depends on the driver used (cf. Chapter 6).	
Unit/State	Select from the proposed list the analogue unit or logical state that is appropriate for the value of the variable. Units of the /xxx/yyy type correspond to logical states. If the units presented by default are not suitable for your need, click on [add a unit] (see section on Units).	

Refresh period	Refresh period for the variable in ms (the value 0 means as soon as possible). If this value is set to 0, the variable will be refreshed "as soon as possible". An acquisition period greater than 0, on the contrary, makes it possible to prioritize variable read/write operations. The input variables are read at the set period. The input/output variables are read at the set period and are written on request. The output variables are written at the set period. For variables on a virtual peripheral, this period corresponds to the time between two executions of the formula.
-----------------------	---

Operation	The acquisition of the variable can be enriched by operations performed as of variable reading. In the case of a variable on a peripheral, the operation is applied to the value read on the peripheral (after possible scaling related to the type of signal). In the case of writing, the reverse operation is applied to the value of the variable before sending it to the peripheral (with, where applicable, reverse scaling related to the type of signal).
------------------	---

In the case of a virtual variable, the operation applies only if the value of the variable is modified by its own formula.

List of operations	Description
Slope	Makes it possible to perform scaling or correction of the raw values of variables. Enter the "direction parameter" and "intercept point" values for the "$y = ax + b$" function to be executed correctly: ■ y = "corrected value" ■ a = direction parameter of the straight line ■ x = "value read" ■ b = intercept point

Mask	Used to separate bits in a word. Calculated value = value read AND value of the mask. Used especially for reading a bit in a word. Only the Boolean and DWORD storage formats are authorized with this operation. The other types cause an error on the variable. In Boolean, the result equals 1 if the corresponding bit (or at least one of the bits) in the mask is at 1 in the value read. In DWORD, the value equals the result of the bitwise AND operation between the value read and the mask.
------	---

Example: reading of bit 5 in a 16-bit word

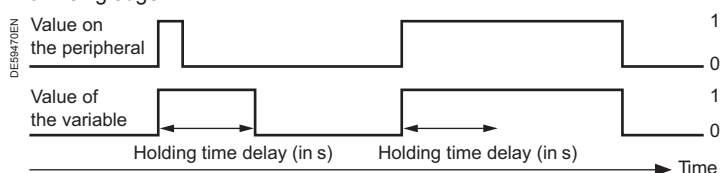
Bit	15	...	7	6	5	4	3	2	1	0
Value of the mask	32768	...	128	64	32	16	8	4	2	1

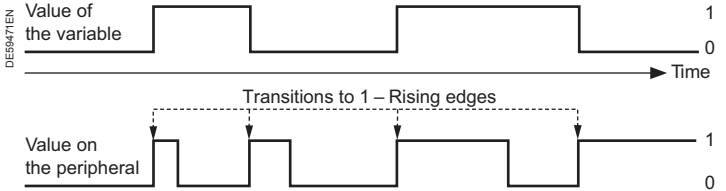
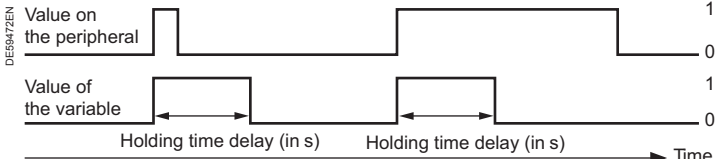
The mask must therefore be set to 16.

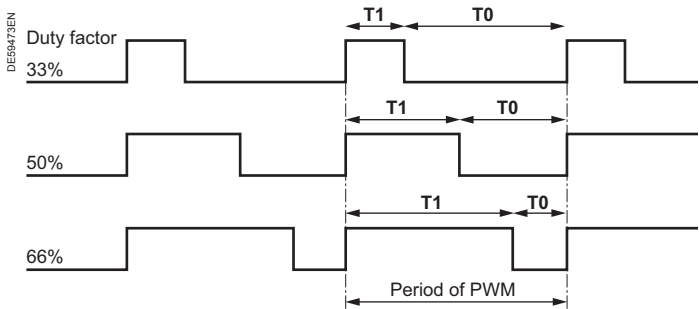
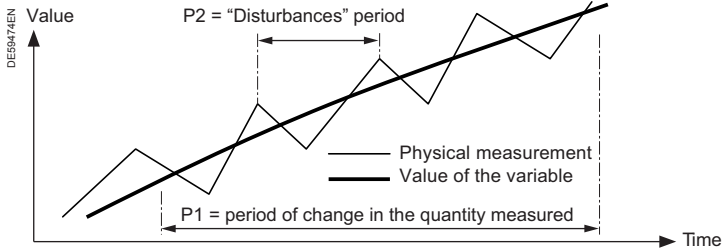
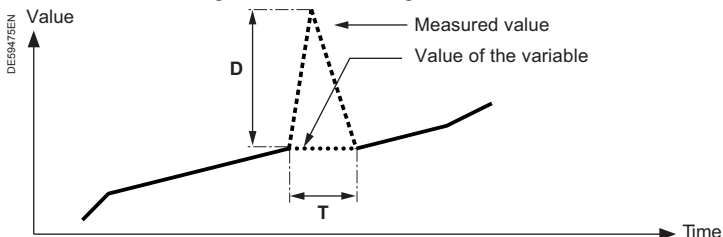
NB: when this operation is invoked, the storage format must be either Boolean, or else the value stored will not be 0 or 1 but the result of the operation (in our example 0 or 16).

Time counter	The storage format recommended for the variable is DWORD. The other types are accepted but the behaviour obtained may not be that expected. The variable equals the number of seconds during which the value read on the peripheral is in the documented state. The time obtained is multiplied by the <i>coefficient of multiplication</i>. For example, with a coefficient of 0.0000277 (1/3600) we obtain the time in hours. This operation does not apply on an output. In the case of an input/output, modification of the value of the variable makes it possible to modify the set point of the time counter but does not send any writing order to the peripheral.
--------------	---

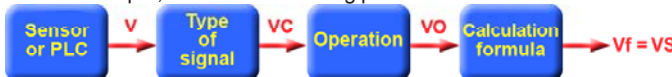
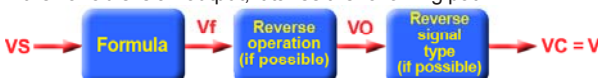
Tempo retain	The storage format MUST BE Boolean. The other types cause an error on the variable. On the <i>rising edge</i> (transition to 1), the variable takes the value 1 during at least "holding time delay" seconds. On the <i>falling edge</i> (transition to 0), the variable takes the value 0 during at least "holding time delay" seconds. If the state on the peripheral is maintained beyond the holding time delay, the value of the variable is also maintained. The following timing diagrams illustrate the time-delayed holding operation in reading on rising edge:
--------------	--



Operation (cont'd)	List of operations	Description
	Change of edge	The storage format MUST BE Boolean in input only. The other types cause an error on the variable. On the <i>rising edge</i>, the variable changes state (0 or 1) at transition of the value read to 1. On the <i>falling edge</i>, the variable changes state (0 or 1) at transition of the value read to 0. The following timing diagrams illustrate the change of edge operation in reading on <i>rising edge</i>: 
	Edge counter	The storage format recommended for the variable is DWORD. The variable equals the number of times that the value read on the peripheral goes from 0 to 1 if <i>rising edge</i>, or goes from 1 to 0 if <i>falling edge</i>. The counting result is multiplied by the <i>coefficient of multiplication</i>. This operation does not apply on an output. In the case of an input/output, modification of the value of the variable makes it possible to modify the set point of the edge counter but does not send any writing order to the peripheral.
	Differential	The variable must not be an output. Difference between the current value and the value read at the previous acquisition period. $\text{Val calculated} = (\text{Val read} - \text{Previous Val read}) \times \text{coefficient of multiplication}$ The time between two readings depends on the acquisition period. This difference occurs on the raw value of the variable read, it does not take into account any calculation formulae that could change its value.
	Gradient (or derivative)	The variable must not be an output. Change in the variable over the last acquisition period (derivative). $\text{Value calculated} = ((\text{instantaneous value} - \text{previous value}) / (\text{current time} - \text{previous time})) \times \text{coefficient of multiplication}$ In other words: the variable equals the derivative (difference divided by the time in seconds) of the value read on the peripheral multiplied by the coefficient of multiplication. The derivation period depends on the acquisition period.
	Inversion	The storage format MUST BE Boolean. The other types cause an error on the variable. Inversion of the value read.
	Sensor Min.-Max. 4-20 mA	Only for a read/write on a 4-20 mA sensor, enters the min. value corresponding to 4 mA and max. for 20 mA. Example: ■ Signal type = 4-20 mA. ■ Value for 4 mA (min. value): –100°C ■ Value for 20 mA (max. value): +100°C You must therefore set in min. value –100 and in max. value +100.
	Pulse	The storage format MUST BE Boolean. The other types cause an error on the variable. On the <i>rising edge</i>, at transition to 1, the variable takes the value 1 during "<i>holding time</i>" seconds. On the <i>falling edge</i>, at transition to 0, the variable takes the value 0 during "<i>holding time</i>" seconds. If the state on the peripheral is maintained beyond the holding time, the value of the variable returns to the initial state (0 if <i>rising edge</i>, 1 if <i>falling edge</i>). The following timing diagrams illustrate the pulse operation in reading with edge at 1: 

Operation (cont'd)	List of operations	Description
	Time proportional or PWM (Pulse Width Modulation)	This operation applies ONLY on a physical output. The storage format MUST BE WORD. The other types cause an error on the variable. Generates a square-wave signal (0 or 1) for which the duty factor as a % is given by the value of the variable. The signal period is entered as a parameter (period field). If the value of the variable is less than or equal to 0%, the value written on the peripheral is constant at 0. If the value of the variable is greater than or equal to 100%, the value written on the peripheral is constant at 1. Note that with this operation, the value of the variable does not correspond to the command sent to the peripheral, which is Boolean (0 or 1). It is used, for example, in on/off electric heater control. The following timing diagrams illustrate the time proportional operation:  $T1 = R\% \times \text{Period}$ $T0 = (100 - R\%) \times \text{Period}$ $R\% = \text{Duty factor, } T1 \text{ time during which the command written is 1}$ $T0 \text{ time during which the command written is 0.}$
	Smoothing	This operation applies ONLY on an ANALOGUE input. The storage format must be IEEE or DIEEE. A different configuration will not cause an error but the behaviour obtained is not guaranteed. Applies a low-pass filter of the first order on the values read. The cutoff frequency is documented with the <i>minimum period</i> (in seconds) below which the values are filtered. For example, for an analogue value for which the variation period is 10 minutes (<i>minimum period</i> = 600 seconds), fluctuations of lower period will not be taken into account. For example, if the level of a tank varies significantly every 10 minutes, the minor level variations due to surface waves will be smoothed.  For smoothing to be effective, P2 must be far less than P1 by at least a ratio of 3, $P2 < 3 * P1$.
	Filtering	This operation applies ONLY on an ANALOGUE input. The storage format must be IEEE or DIEEE. Filters aberrant values on the physical measurement. The "<i>maximum differential</i>" and "<i>minimum period</i>" fields (in seconds) define the criteria beyond which the measurement will be ignored. For example, of <i>maximum differential</i> = 10 and <i>minimum period</i> = 2 s, a sudden change in the measurement greater than 10 during a time less than 2 seconds will be ignored.  The ratio D/T is greater than the maximum differential/minimum period ratio, the value read is therefore ignored, and the value of the variable remains unchanged.

Operation (cont'd)

List of operations	Description																																	
Input/Output	Only for variables on a non-virtual peripheral. ■ Input: the variable is read at each acquisition period ■ Output: the variable is written at each acquisition period ■ Input/Output: the variable is read at each acquisition period and it is written at each remote control order ("one shot"). If the variable is an input, it takes the following path:  V = Value returned by the PLC or the sensor VC = Value changed depending on the type of signal VO = Value changed after the operation Vf = Value after the formula VS = Value stored If the variable is an output, it takes the following path:  Comment: for a variable in input/output, the writing orders take priority over reading of the other variables, while the calculation formula, for its part, is not executed.																																	
Modifiable value	Only for variables on a virtual peripheral. Define a mode of access to the variable. ■ Yes = enables modification of the value ■ No = inhibits modification of the value																																	
Formula	Defines a calculation formula (see chapter on calculation formulae) to be executed after reading a variable or before writing.																																	
Storage format	Format for display of the value read in the dashboards and the alarm and event histories. In most cases, choose: ■ Boolean for a logical variable (digital) ■ IEEE for an analogue variable ■ DWORD for a counter variable <table><tr><td>1</td><td>Boolean</td><td>Bit, logical value (0 or 1)</td></tr><tr><td>2</td><td>Byte</td><td>Byte, unsigned integer value from 0 to 255</td></tr><tr><td>3</td><td>Int 8</td><td>Signed integer value from -128 to 127</td></tr><tr><td>4</td><td>Int 16</td><td>Signed integer value from -32768 to 32767</td></tr><tr><td>5</td><td>Int 32</td><td>Signed integer value from -2147483648 to 2147483647</td></tr><tr><td>6</td><td>Word</td><td>16-bit word, unsigned integer value from 0 to 65535</td></tr><tr><td>7</td><td>Dword</td><td>32-bit word, unsigned integer value from 0 to 4294967295</td></tr><tr><td>8</td><td>IEEE</td><td>Floating point, single precision decimal value (with decimal point)</td></tr><tr><td>9</td><td>DIEEE</td><td>Floating point, double precision decimal value</td></tr><tr><td>10</td><td>Time</td><td>Value representing a date in format "dd/mm/yy hh:mm:ss"</td></tr><tr><td>11</td><td>String</td><td>Character string of maximum size 347 characters.</td></tr></table>	1	Boolean	Bit, logical value (0 or 1)	2	Byte	Byte, unsigned integer value from 0 to 255	3	Int 8	Signed integer value from -128 to 127	4	Int 16	Signed integer value from -32768 to 32767	5	Int 32	Signed integer value from -2147483648 to 2147483647	6	Word	16-bit word, unsigned integer value from 0 to 65535	7	Dword	32-bit word, unsigned integer value from 0 to 4294967295	8	IEEE	Floating point, single precision decimal value (with decimal point)	9	DIEEE	Floating point, double precision decimal value	10	Time	Value representing a date in format "dd/mm/yy hh:mm:ss"	11	String	Character string of maximum size 347 characters.
1	Boolean	Bit, logical value (0 or 1)																																
2	Byte	Byte, unsigned integer value from 0 to 255																																
3	Int 8	Signed integer value from -128 to 127																																
4	Int 16	Signed integer value from -32768 to 32767																																
5	Int 32	Signed integer value from -2147483648 to 2147483647																																
6	Word	16-bit word, unsigned integer value from 0 to 65535																																
7	Dword	32-bit word, unsigned integer value from 0 to 4294967295																																
8	IEEE	Floating point, single precision decimal value (with decimal point)																																
9	DIEEE	Floating point, double precision decimal value																																
10	Time	Value representing a date in format "dd/mm/yy hh:mm:ss"																																
11	String	Character string of maximum size 347 characters.																																
Type of signal	Specifies the type of channel and applies scaling of the value read depending on the type of sensor connected. Usable mainly for RIO cards. Example for a Nickel 1000 type temperature sensor: ■ Channel: R1 (resistance 1 channel) ■ Type of signal: NI 1000																																	
Class	Without explicit instructions, leave this field empty. The value of this field is useful only in certain cases, especially when using a PCText type Central Station. If you want to transmit values of variables during cyclical calls to a PCText central station, supplement with: ■ 6-XX for counting ■ 8-XX for measuring Complying with the consistency between variables and associated alarms (if alarms are associated with these variables) in accordance with the following example: ■ Variable CLASS field: 8-56 ■ Alarm CLASS field: 56 ⚠ For the TELYO Central Station using the PCText protocol, remember to create, at the central station level, TM or TC channels with 2 characters, then set the History field to Yes, and finally choose an appropriate display format.																																	

Introduction

Xflow can store time tagged data in history files.

Six file types are available:

- Alarm file
- Connections file
- Outgoing calls file
- Event files
- Measurement files
- State files.

The histories define files which allow second-by-second time tagged backup of events occurring on the system (alarm, event, incoming call – or connection –, outgoing call) or values of variables (measurement file, state file).

Files are managed according to the principle of **FIFO stack** (First In, First Out) storage. Once the file is full, each new record erases the oldest one.

The default configuration proposes:

- 1 alarm file
- 1 connections file
- 1 outgoing calls file.

These files can be deleted if they are not necessary for your application:

→ Click on [suspend recording], then [delete file]

In the Xflow configuration, there can be only a single file with the following types:

- Alarms
- Connections
- Outgoing calls.

In the Xflow configuration, there can be several files with the following types:

- Events
- Measurements
- States.

Difference between an Alarm type file and an Event type file:

Both these file types save the same types of data generated by the alarms defined in the Xflow configuration.

The events recorded in the Alarm type file can generated calls to recipients.

Accordingly, faults will be saved preferably in the Alarm type file whereas events related to supervision of the facility (pump starting/stopping, for example) will be saved rather in Event type files.

The total number of files depends on the hardware platform on which Xflow runs (see section of capacity in Chapter 2).

Dynamic control of histories

Site : xflow_demo

Home page

English ▼

29/04/10 23:44:13 | Logout

Dashboard
Synoptics
Histories
Peripherals
Configuration

Home page → Configuration → Histories

Status	Name	Type	Nb recording
	ALARMS	Alarm	0
	EVENT	Event	0
🔒	STATES	State	0
	CNX_IN	Connection	4
	CNX_OUT	Out calls	0
🔒	ENERGY_H	Measure	1
	ENERGY_D	Measure	0
	ENERGY_M	Measure	0
🔒	ENERGY_Y	Measure	0
	GI	Measure	31
	GI_H	Measure	1

Status

🔒 Locked

❌ Closed: check that backup is activated.

Details of history parameters

Name	Name the history with a customizable title. Choose a name without spaces or punctuation characters, and with a maximum of 8 characters. By default, the name is of the form FIL000xx.		
Status	Backup in progress	File open: saving to the file is in progress.	
	 Locked	File closed: saving to the file has been stopped deliberately. To start saving again, click on [Activate backup]	
	 File in error	The possible errors are as follows: “Directory cannot be found”: the files are stored in a default directory. That is why the storage directory for the files is not accessible directly in the files configuration page, but only in “Advanced Settings/Database”. This error should not occur, unless it is the consequence of another error. If the directory is correct, a click on [Clear/initialize file] will undoubtedly be able to solve the problem. “Cannot create file”: the directory is correct but creation of the file on the dish aborted during formatting (a click on [Clear/initialize file] will generate a new file creation attempt). “File too big”: the available disk space is inadequate to store the file (reduce the max. number of records, or, for the measurement files, reduce the number of variables to be recorded or use more appropriate storage types (IEEE rather than DIEEE for an analogue value, etc.). “Write failure”: a writing error in the file occurred during the formatting phase (when a formatting request is made, the file is created directly at its max. size, then it is filled with 0's). “File invalid”: an inconsistency was detected either when formatting the file or at file opening (file type non-existent, file size incompatible with the configuration, etc.). - 16 – or “Formatting requested”: appears when, at start-up of Xflow, files exist in the histories configuration whereas they are not physically present on the disk (case of downloading of a new configuration containing history names different from those of the current configuration). - 0 – or “closed”: the file is closed. Generally appears after having clicked on [Clear/initialize file]. Click on [Activate backup] to start historization.	
Type	Type	Description	Number
	Alarm	It contains all the alarms that have been set in Xflow. Any “event” tripping a call is called an alarm. Deletion of the alarm file would cause deletion of the alert calls.	Single one
	Event	An event is an “alarm” that will never trip alert calls. Each alarm can be saved either to the alarms file or to an events file. Various event histories can be configured, thus allowing grouping (e.g. one history for events related to pumps, another for events related to the tank, etc.).	Several
	Connection	Saves all the user sessions on the device	Single one
	Outgoing calls	Saves all outgoing calls made by the device	Single one
	Measurement	The measurement histories can be used to store in memory regularly and/or differentially (upon a change in one or more variables) the variables declared beforehand. All the variables can be stored in memory in various formats and by performing various operations . <i>It is recommended to store logical (digital) variables in Boolean, analogue variables in IEEE and counter variables in DWORD. The minimum backup period is the second.</i>	Several
	State	This file type can time tag a change of state of a variable (logical or analogue). Accordingly, each recording contains the date, the name of the variable which has changed state, and its former and new values. Unlike a measurement file, each recording contains only the variable that has changed state.	Several

Max. number of records	Maximum number of loggings contained in the history file. The bigger this number, the more space the file takes on the “disk” of the local station.
Storage directory	This field does not appear in the files configuration page. It is accessible only in database access (cf. Advanced Settings). For specific exceptional cases, it is possible to change the default storage directory for the file (see memory organization in Chapter 7). ■ iRIO: \SRAMDISK\ ■ PC: Xflow.exe\Temp path

Configuration of a measurement or state file

Backup period	For measurement files only. Backup period according to various possible units (hours, minutes, seconds, days, weeks, months). The value 0 inhibits regular backup. It is possible to combine the types of backups (regular and differential).																						
Date of next backup	For measurement files only. Date of next backup. This date, if it is empty, will be calculated automatically depending on the period. It should be documented in format “dd/mm/yy hh :mm :ss”.																						
Minimum period in differential	For measurement files only. Minimum differential period. This can limit differential backup in the case of excessively rapid variations. There will be at least the time set (in seconds) between 2 differential backups.																						
Select variables to be saved	Click on [Add a variable] Save in ENERGIE_H (Measure) Note: : it is also possible to add variables to an existing history from the variables configuration page.																						
Operation	(For measurement files only) The variables can be saved as is (raw), or assigned an operation <table> <thead> <tr> <th>Operation</th><th>Description</th></tr> </thead> <tbody> <tr> <td>No</td><td>No operation. The value of the variable is stored as is.</td></tr> <tr> <td>Minima</td><td>The minimum value of the variable during the backup period is saved in the file. At each regular backup, the minimum value is reinitialized with the current value of the variable.</td></tr> <tr> <td>Maxima</td><td>The maximum value of the variable during the backup period is saved. At each regular backup, the maximum value is reinitialized with the current value of the variable.</td></tr> <tr> <td>Mean</td><td>The value saved is the mean of the variable over the backup period.</td></tr> <tr> <td>Time > 0</td><td>The cumulative time (in seconds) over the backup period during which the value of the variable was greater than 0 is saved in the file. At each regular backup this time is reinitialized to 0.</td></tr> <tr> <td>Time at 0</td><td>The cumulative time (in seconds) over the backup period during which the value of the variable was equal to zero is saved in the file. At each regular backup this time is reinitialized to 0.</td></tr> <tr> <td>Edge counter</td><td>The number of rising edges (transition from 0 to 1) over the backup period for the value of the variable is saved in the file. At each regular backup this number is reinitialized to 0.</td></tr> <tr> <td>Differential</td><td>The value saved represents the difference between the current value of the variable and the current value at the time of the preceding backup. <i>Be careful not to confuse with the differential backup mode!</i></td></tr> <tr> <td>Init counter</td><td>The current value of the variable at the time of backup is saved in the file. Then, this current value is reset in the table of variables. It is used in particular if the value is a counter.</td></tr> <tr> <td>Standard deviation</td><td>The standard deviation of the value of the variable over the backup period is saved in the file.</td></tr> </tbody> </table>	Operation	Description	No	No operation. The value of the variable is stored as is.	Minima	The minimum value of the variable during the backup period is saved in the file. At each regular backup, the minimum value is reinitialized with the current value of the variable.	Maxima	The maximum value of the variable during the backup period is saved. At each regular backup, the maximum value is reinitialized with the current value of the variable.	Mean	The value saved is the mean of the variable over the backup period.	Time > 0	The cumulative time (in seconds) over the backup period during which the value of the variable was greater than 0 is saved in the file. At each regular backup this time is reinitialized to 0.	Time at 0	The cumulative time (in seconds) over the backup period during which the value of the variable was equal to zero is saved in the file. At each regular backup this time is reinitialized to 0.	Edge counter	The number of rising edges (transition from 0 to 1) over the backup period for the value of the variable is saved in the file. At each regular backup this number is reinitialized to 0.	Differential	The value saved represents the difference between the current value of the variable and the current value at the time of the preceding backup. <i>Be careful not to confuse with the differential backup mode!</i>	Init counter	The current value of the variable at the time of backup is saved in the file. Then, this current value is reset in the table of variables. It is used in particular if the value is a counter.	Standard deviation	The standard deviation of the value of the variable over the backup period is saved in the file.
Operation	Description																						
No	No operation. The value of the variable is stored as is.																						
Minima	The minimum value of the variable during the backup period is saved in the file. At each regular backup, the minimum value is reinitialized with the current value of the variable.																						
Maxima	The maximum value of the variable during the backup period is saved. At each regular backup, the maximum value is reinitialized with the current value of the variable.																						
Mean	The value saved is the mean of the variable over the backup period.																						
Time > 0	The cumulative time (in seconds) over the backup period during which the value of the variable was greater than 0 is saved in the file. At each regular backup this time is reinitialized to 0.																						
Time at 0	The cumulative time (in seconds) over the backup period during which the value of the variable was equal to zero is saved in the file. At each regular backup this time is reinitialized to 0.																						
Edge counter	The number of rising edges (transition from 0 to 1) over the backup period for the value of the variable is saved in the file. At each regular backup this number is reinitialized to 0.																						
Differential	The value saved represents the difference between the current value of the variable and the current value at the time of the preceding backup. <i>Be careful not to confuse with the differential backup mode!</i>																						
Init counter	The current value of the variable at the time of backup is saved in the file. Then, this current value is reset in the table of variables. It is used in particular if the value is a counter.																						
Standard deviation	The standard deviation of the value of the variable over the backup period is saved in the file.																						

Operation (cont'd)	Operation	Description
	Storage format	Display format for the value read in the measurement histories. In most cases, choose: ■ Boolean for a logical variable (digital) ■ IEEE for an analogue variable ☐ Boolean Bit, logical value (0 or 1) ☐ Byte Byte, unsigned integer value from 0 to 255 ☐ Int 8 Signed integer value from –128 to 127 ☐ Int 16 Signed integer value from –32768 to 32767 ☐ Int 32 Signed integer value from –2147483648 to 2147483647 ☐ Word 16-bit word, unsigned integer value from 0 to 65535 ☐ Dword 32-bit word, unsigned integer value from 0 to 4294967295 ☐ IEEE Floating point, single precision decimal value (with decimal point) ☐ DIEEE Floating point, double precision decimal value ☐ Time Value representing a date in format "dd/mm/yy hh:mm:ss"
	Differential	For measurement files only. Trips backup in the file whenever an absolute variation in the value of the analogue variable since the last backup exceeds the value of the differential. It does not apply to Boolean variables. The differential parameter must be positive. If the differential equals 0, tripping of backup on this variable will not be enabled. The calculation of the differential takes into account the operation applied to the variable in the file. The operations are not affected by a differential backup, the calculation period remains constant and equal to the backup period.
	Hysteresis	For state files only. Causes backup in the file whenever an absolute variation in the value of the analogue variable since its last backup exceeds the value of the hysteresis. It does not apply to Boolean variables. The hysteresis parameter must be positive.
	Activate backup	To run backup in a file, click on [activate backup]. To suspend backup in a file, you must click on "Suspend backup". To add variables, backup must not be activated.

Example of evaluation of the size of a measurement file

You want to save in a measurement file: 2 temperatures (in IEEE format, i.e. 4 bytes) and a logical variable (in Boolean format, i.e. one byte).

A record for this file will contain:

- The date of saving (4 bytes)
- The 2 analogue values (2x4 bytes)
- The logical value (1 byte).

The size of a record will therefore be 13 bytes (this size can be checked in the "LENGTH" field of the FILES table, either with Kervisu or on the Web in Advanced Settings → Database).

If 100 records are configured for this file: the file will occupy on the disk: 100 x 13 + 15 (file header), i.e. 1315 bytes.

Introduction

The recipient is the entity (a person, a fax, etc.) responsible for receiving alarms. Xflow supports a large number of recipient types: mobile phones with SMS sending, emails, Kerwin (Schneider Electric Telecontrol alarm centralization software), etc.

Dynamic control of a recipient



Site : xflow_demo
Home page
Dashboard Synoptics Histories Peripherals Configuration

English
29/04/10 23:50:56 | Logout

Home page → Configuration → Recipients

Status	Name	Support	Active alarms	Connection state	Delay (in s)
	KERWIN_IP	KERWIN	0	OK	0
	My_FTP_Srv	Ftp	0	OK	0

[add a recipient]

Status

-  **Locked** The locked is locked; no call can go out.
-  **Waiting for repeat call** It is necessary to wait before calling this recipient again. The waiting time is shown in the "Delay" column.
-  **Alarm sending failure** The recipient could not be reached. The direction is not available (inhibited) for 1 hour. The waiting time before sending again is shown in the "Delay" column.
-  **Invalid recipient** The recipient is blacklisted. No call is possible on this direction. Manual revalidation of a user will be needed (by clicking on the recipient in question and then on the [Revalidate this recipient] button for this direction to be operational again).

Time delay: waiting time before redialing

Availability of a recipient

A recipient is said to be "unavailable"  when it is no longer called to receive an alarm.

This unavailability may be temporary or permanent (referred to in this case as *invalidated recipient* ). In the latter case an operation by a user is necessary to [revalidate this recipient].

When a recipient is unavailable (or invalid), the alarms waiting to be transmitted are then transferred to the backup recipient (see "Alarm procedures" chapter).

The following table gives details of the various statuses that a recipient can have:

Status	Description
Blacklisted number	The recipient is invalidated  . The operator MUST log on to Xflow to revalidate it manually so that the alarms are sent to it again. This state is reached after 4* consecutive <i>protocol failures</i> or else 4* consecutive calls with loss of carrier wave.
Max. failures reached	The recipient is invalidated  for 1 hour . The operator can log on to Xflow to revalidate this recipient before the deadline of one hour. This state is reached after 4 consecutive <i>call failures</i> or <i>line busy</i> .
Acknowledgement failure	The recipient is invalidated  for 1 hour . The operator can log on to Xflow to revalidate this recipient before the deadline of one hour. This state is reached after sending N <i>acknowledgement attempts</i> without the alarm being effectively acknowledged by a user.
Waiting for acknowledgement	The recipient is suspended during the acknowledgement delay time until a user acknowledges the alarm. After this time the alarm is again sent to the recipient the number of times set in <i>acknowledgement attempt(s)</i> - 1.
Protocol failure	The recipient's configuration leads to a protocol failure. The recipient is suspended for 10 minutes before making a new call attempt. After 4* successive attempts in protocol failure, the recipient is invalidated with the <i>blacklisted number</i> status.
Line busy	The call to the recipient arrives at a busy telephone line. The recipient is suspended for 5 minutes before making a new attempt. After 4* successive attempts in line busy, the recipient is unavailable with the status <i>Max. failures reached</i> .
Call failure	All other cases of call failure. The call to the recipient failed. It is suspended for 2 minutes before making a new attempt. After 4* consecutive failures, the recipient is unavailable with the status <i>Max. failures reached</i> .
Legal wait for repeat call	The call to the recipient was successful, a minimum time delay of 2* minutes is complied with between two consecutive calls to the same recipient.  to be allowed for during alarm tests. There cannot be 2 consecutive calls spaced less than 2 minutes apart; a new call can be initiated before the deadline of 2 minutes by clicking on [Revalidate this recipient].

(*) Default values commonly accepted on Xflow (avoid repeated call failures). For certain exceptional cases of use (e.g. private lines), these values can be changed. Ask a Schneider Electric technician for advice.

 It is strongly recommended to create an alarm on invalid recipient to prevent unwanted calls (4 per hour in the event of line busy or non-acknowledgement), and to secure the system.

 Local serial, local modem and local GSM type links can be configured to limit the number of outgoing calls per day (cf. Links). If this number is reached, the recipients are indicated as unavailable and will be operational again when the daily call counter has been reset at the link level (upon manual action or at midnight).

Configuration of a recipient

Name	Name of recipient. This must be unique At most 20 characters.
Recipient type	The call media are as follows: ■ Default ■ Beeper ■ FAXC2 (Class 2 FAX) ■ Flowtel/Teleflo ■ Kerwin ■ KerwinPPP ■ FTP ■ Ker SMS ■ E-Mail ■ PCText ■ Serial printer ■ Intersite ■ GSM/SMS ■ TAP ■ TAP AGCOM ■ Teletel (Orange, SMS, SFR, Pager, Espresso) The most common media are described below; for the others, refer to Chapter 8, “Alert media”.
Connection	Link to be used to call the recipient
Transmit upon return to normal	An alarm is always sent to the recipient when it goes into fault. This setting can be used to specify whether a second call should be sent to indicate return to normal. Event-triggered alarms (cyclical calls), for their part, are always sent.
Acknowledgement attempt	■ Automatic acknowledgement: a single call, no wait for acknowledgement by the recipient ■ 1, 2, 3 or 4: maximum number of attempts before acknowledgement. In this case acknowledgement must be performed manually before a lapse of time equal to the Acknowledgement delay. If this manual acknowledgement does not occur during this lapse of time, the alarm is returned to the recipient a number of times equal to the Acknowledgement attempts – 1. If acknowledgement has still not occurred on completion of this number of attempts, there will be no more calls on this direction. The recipient will be considered as unavailable for about one hour. The acknowledgement delay will appear automatically on the following page if “Acknowledgement attempt” is set to a number >0.
Acknowledgement delay	For all types of recipient except DEFAULT, when the number of acknowledgement attempts is greater than or equal to 1. Time delay after which the call is retransmitted for want of acknowledgement.
Acknowledgement key	Reserved for future use, leave at 0
Number of successful calls	Number of calls that made it possible to send at least one alarm
Number of failed calls	Number of consecutive calls that have not made it possible to send at least one alarm. This number is reset as soon as a call is again successful.
Number of active alarms	Number of active alarms waiting to be sent to this recipient
Time before next call (in s)	Time in seconds before a new call can be made. When a call has occurred, the direction is inhibited for 2 minutes. If there are a total of 4 consecutive failed calls, the direction is inhibited for 1 hour. To revalidate the direction, click on [Revalidate this recipient].
Connection state	Status of the last call
Cumulative connection time (in s)	Total connection time with this alarm recipient

Configuration

Alarm recipients

Configuration of a Beeper recipient (call by modem)

Telephone	Phone number of the Beeper modem
Modem initialization string	String to be sent to the modem before dialling, if necessary
Class	Not applicable for this medium

Configuration of a Kerwin recipient (call by modem)

Acknowledgement attempt	Automatic acknowledgement
Address	Not applicable
Logon name	Not applicable
Password	Not applicable
Telephone/IP address	Phone number of the Kerwin modem or IP address of the Kerwin server (depends on the link associated with the recipient (local modem, local GSM or UDP, TCP))
Modem initialization string	String to be sent to the modem before dialling, if necessary
Class	Not applicable for this medium

Configuration of an FTP recipient

Format	Define the format adopted for filling in the files' content: ■ Txt_tab ■ Txt_SMS ■ Tabulated ■ Text ■ Napac_SMS ■ Gamos_CSV
Message	Message to be copied in the alarm file. It is possible to insert "Meta fields" to send information relating to an alarm (cf. section on the syntax of messages slightly further on in this chapter).
Attached files (:)	Path and name of the file(s) to be attached to the message
Options	Defined if the name of the files that will be transferred should be prefixed with a generic name which may consist of: ■ The current date (Date) ■ The name of the site (Site)
Far-end FTP folder	Folder in which Xflow will place itself on the FTP server before transferring these files to it.
User name	User name for logon to the FTP server
Password	Password linked to the user name
IP address of FTP server (:Port)	IP address or DNS name of the FTP server followed by its port number if it is different from 21
Class	Not applicable for this medium

Configuration of an email recipient

Allows alarm sending in email form.

The emails can be transmitted from the iRIO's internal modem, or via an Ethernet link.

 It is possible to send emails on mobile phones. Consult your operator.

Subject	Subject of the email that will be sent
Message	Message to be copied in the alarm file. It is possible to insert "Meta fields" to send information relating to an alarm (cf. section on the syntax of messages slightly further on in this chapter).
Email address	Email address of the person to whom the alarm is sent (e.g.: pierre.durant@schneider-electric.fr)
Logon name for email server	Address of the subscriber to the email server (e.g.: peuvrard@free.fr)
IP address of email server	IP address of the email server ⚠ On a PC in PPP (i.e. via a provider on the telephone network), only the IP address of the server is possible (not possible to go via the name) ⚠ Some email servers regularly change IP address. In this case, it is compulsory to go via the server name (this is the case for the smtp.wanadoo.fr server). ⚠ If the link is of the TCP type, the server must be in SMTP protocol.

⚠ It is necessary to also configure your Internet connection (telephone No. of your provider, logon name and password) in the Advanced Configuration/System Settings section.

Configuration of a serial printer recipient (on serial link only)

Message	Message to be printed. It is possible to insert "Meta fields" to send information relating to an alarm (cf. "section on the syntax of messages" slightly further on in this chapter).
Class	Not applicable for this medium

Configuration of a GSM SMS recipient (with GSM modem only)

⚠ The Xflow modem used on the selected link must be a GSM modem.

Message	Message to be sent to the server. This message must be less than 160 characters. It is possible to insert "Meta fields" to send information relating to an alarm (cf. "section on the syntax of messages" slightly further on in this chapter). ⚠ Make sure that there are no accented characters in the final message to be sent
GSM, pager number	Phone number of the mobile phone that is to receive the message
Modem initialization string	<i>Write nothing for use with iRIO.</i> String to be sent to the modem before dialling, if necessary.
Class	Not applicable for this medium

Configuration of a TAP recipient (7bitspp) (GSM SMS and Expresso with or without subscription)

Allows a message to be sent to a mobile phone via SMS or to an Expresso pager without subscription via the TAP server from Clever Technologies.
This service is on a subscription basis; contact Clever Technologies, BP 2050 31018 Toulouse cedex, France – Tel: +33 (0)5 61 11 44 44 – Fax: + 33 (0)5 61 11 46 03.
The messages transmitted are of lower unit cost. The total cost of the service is advantageous when there are a large number of messages to be transmitted.

Message	Message to be sent to the server. This message must be less than 160 characters. It is possible to insert "Meta fields" to send information relating to an alarm (cf. "section on the syntax of messages" slightly further on in this chapter).
Mobile phone number	Phone number of the mobile phone or pager that is to receive the message
Password	Delivered by Clever Technologies
Server centre number	Delivered by Clever Technologies
Modem initialization string	String to be sent to the modem before dialling, if necessary
Class	Not applicable for this medium

Configuration of an AGCOM TAP recipient (GSM SMS and Expresso with subscription)

Allows messages to be sent to a mobile phone via SMS or to an Expresso pager with subscription via the AGCOM TAP server.
This service is without subscription, and it is limited to use in France.
Its cost is advantageous when there are few messages to be transmitted (€0.56/call as at 01/06/2002).

Note: how to recognize an Expresso pager with or without subscription

Type	Range of numbers
with subscription	06 57 48 00 00 to 06 57 49 99 99
without subscription	06 56 00 00 00 to 06 57 47 99 99 06 57 54 00 00 to 06 57 55 99 99

Message	Message to be sent to the server. This message must be less than 160 characters. It is possible to insert "Meta fields" to send information relating to an alarm (cf. "section on the syntax of messages" slightly further on in this chapter).
Mobile phone number	Phone number of the mobile phone or pager that is to receive the message
Password	None or NAPAC
Server centre number	08 97 65 12 31
Modem initialization string	String to be sent to the modem before dialling, if necessary
Class	Not applicable for this medium

Configuration of an SMS or Pager recipient via Teletel servers (in France)

Allows messages to be sent to a mobile phone via SMS or to an Alphapage/Expresso pager with or without subscription via the operators' Teletel servers.

⚠ Teletel servers are available only in France. Attention: certain French overseas territories and "départements" are not covered by these services.

⚠ The Bouygues Teletel server (3615 BOUYGUESTEL) was stopped on 1st January 2004. The Teletel server of SFR (3617 SFRMES) is also planned to be stopped in March 2004.

Message	Message to be sent to the server. This message must be less than 160 characters. It is possible to insert "Meta fields" to send information relating to an alarm (cf. "section on the syntax of messages" slightly further on in this chapter).
GSM, pager number	Phone number of the mobile phone or pager that is to receive the message
Server centre number	3615, 3617, 08... depends on the TELETEL server (cf. Table of available servers)
Modem initialization string	String to be sent to the modem before dialling, if necessary
Class	Not applicable for this medium

Teletel servers accessible via Xflow

Recipients	Type in Xflow	Server number	Service code	Pricing
SMS Orange	SMS-ORANGE (3615)	3615	MINIMESSAGE	T44 = 0.020 + 0.3510 €/min
SMS SFR	SMS-SFR (3617)	3617	SFRMES	T44 = 0.020 + 0.351 €/min
SMS (any operator)	SMS-TELETEL (3615)	3615	SMSGRATUIT	T44 = 0.020 + 0.351 €/min
Alphapage/Expresso with subscription	PAGER-with subscription (3614)	3614	ALPHAPAGE	T20 = 0.020 + 0.060 €/min
Expresso without subscription	EXPRESSO-without subscription	836095050	No code	T92

Note: the service code does not have to be configured in the recipient, Xflow knows it automatically according to the type of recipient that has been chosen.

Configuration of a Flowtel/Teleflo, Intersites, Kerwin PPP, FAX, Kerwin SMS or PCText recipient

See Chapter 8 "Specific alert media".

Syntax of a message (meta field)

A message is a character string that is sent to the user either in an email or on a mobile phone, a pager, a printer, fax, etc.

The message sent corresponds to the message typed in the "Message" field.

However, Xflow offers the possibility of inserting information relating to the alarm that caused the call, by means of "Meta fields".

A meta field is a word consisting of 2 characters and starting with the "&" character.

When compiling the message, the meta fields are replaced by the following corresponding strings:

&A	Nature of alarm (fault/normal)
&C	Alarm commentary
&D	Date/time of alarm
&H	Hour of the alarm only
&L	Alarm class
&M	Name of the alarm
&N	Name associated with the alarm
&P	Phone number of the site
&R	Alarm references
&S	Name of the site which caused the alarm
&T	Alarm type (peripheral, etc.)
&U	Unit
&V	Value of the variable which caused the alarm
&W	Value and unit of the variable which caused the alarm
&X	Site name
&Z	Insertion of a CRLF (new line character)

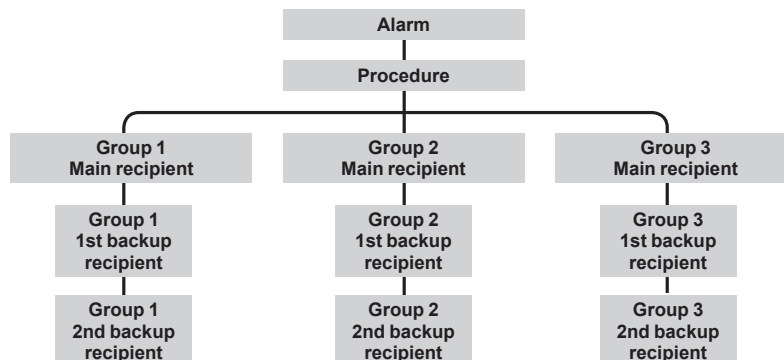
Example: &S, on &D: &M (&W) alarm: the message sent will be:

Eaux Claires boiler plant, on 03/09/02 13:10:00 : Fuel oil level alarm (8%).

Introduction

The alarm procedures serve to define which recipients are to be called upon an alarm. Each alarm is linked to an alarm procedure, and a procedure can be linked to one or more recipients.

- An alarm procedure consists of groups of calls (from 1 to 3).
- Each call group consists of a main recipient and possibly one or two backup recipients who will be called only if Xflow is unable to reach the main recipient.
- An alarm triggers calls to all the groups. Accordingly, a given alarm can be sent to 3 main recipients (and each of these recipients can have up to 2 backup recipients).



Dynamic control of a procedure

Site : xflow_demo
 Home page
 Dashboard Synoptics Histories Peripherals Configuration

English
 29/04/10 23:55:27 | Logout

Home page → Configuration → Procedures

Status	Name	Main addresses
	PROC_KERWIN	KERWIN_IP My_FTP_Srv
	PROC_FTP	My_FTP_Srv

[\[add a procedure\]](#)

Status
 Locked
 No call can go out to the recipients

Main recipients of each of the groups (at most 3)

Configuration of a procedure

Name	Name of the procedure. This must be unique. At most 20 characters
Addition of a call group	Click on [Add a recipient]
Main	The recipient that will normally receive the alarm
First backup	The recipient that will receive the alarm if the main recipient is unavailable
Second backup	The recipient that will receive the alarm if the main recipient and the first backup are unavailable
Delay (in s)	Time in seconds after which an alarm switches over to the following group in case of failure sending to the main recipient. This means it is possible not to wait for the end of the backup calls for a group (which may take many minutes), to go to the following group.

Introduction

An alarm is the detection of a change of state on a logical variable, or detection of an analogue variable crossing a threshold. It can also indicate an anomaly relating to the peripherals, the alert recipients or the system.

An alarm generates:

- Archiving in the alarm file or in an event file
- An alert call if the alarm is archived in the alarm file and if an alert procedure has been configured.

Dynamic control of alarms

Quick search by entering the number

Search by status

Site : xflow_demo
Home page
Dashboard Synoptics Histories Peripherals Configuration

English 29/04/10 23:58:33 | Logout

Home page → Configuration → Alarms

20 Show the alarms with state OK

	Status	Name	Description	Origin	Procedure
20		AL_PTR_16AI_5	PTR - Position Porte Poste Onduleur	Variable	PROC_KERWIN
21		AL_PTR_16AI_6	PTR - Position Porte Poste de Transformation	Variable	PROC_KERWIN
22		AL_PTR_16AI_7		Variable	PROC_KERWIN
23		AL_PTR_16AI_8		Variable	PROC_KERWIN
24		AL_PTR_16AI_9		Variable	PROC_KERWIN
25		AL_PTR_16AI_10		Variable	PROC_KERWIN
26		AL_PTR_16AI_11		Variable	PROC_KERWIN

Status

- Locked
- Active
- Inhibited (by another active alarm)

Configuration of an alarm

Name	Choose a short name (maximum of 20 characters), with neither spaces nor punctuation characters nor characters representing an operator for calculation formulae. △ Each name must be unique. No other alarm, nor any other variable, weekly program, nor any other yearly program, should have the same name, or else errors could be generated in the calculation formulae, because the formulae use the names in their syntax.								
Description	Provides an extended description. Comment with a precise sentence which provides information on the nature and content of the variable. This description must be understandable by all those working on the system (at most 255 characters).								
File	File in which you want to save the alarm (event or alarm file). If you do not want to save the alarm in a file, select "None". A call to an alert recipient is possible only if the alarm file has been selected!								
Origin	There are 4 sources (alarm types) <table> <tr> <td>Variable</td><td>Alarm relating to a variable</td></tr> <tr> <td>Peripheral</td><td>Alarm relating to a peripheral</td></tr> <tr> <td>Recipient</td><td>Alarm relating to a destination</td></tr> <tr> <td>System</td><td>System alarm (start-up, etc.)</td></tr> </table>	Variable	Alarm relating to a variable	Peripheral	Alarm relating to a peripheral	Recipient	Alarm relating to a destination	System	System alarm (start-up, etc.)
Variable	Alarm relating to a variable								
Peripheral	Alarm relating to a peripheral								
Recipient	Alarm relating to a destination								
System	System alarm (start-up, etc.)								
Reference	This field depends on the source of the alarm <table> <tr> <td>Variable</td><td>Variable to which the alarm will apply (the list of variables appears)</td></tr> <tr> <td>Peripheral</td><td>Peripheral to which the alarm will apply (the list of peripherals appears)</td></tr> <tr> <td>Recipient</td><td>Recipient to which the alarm will apply (the list of recipients appears)</td></tr> <tr> <td>System</td><td>The reference does not appear</td></tr> </table>	Variable	Variable to which the alarm will apply (the list of variables appears)	Peripheral	Peripheral to which the alarm will apply (the list of peripherals appears)	Recipient	Recipient to which the alarm will apply (the list of recipients appears)	System	The reference does not appear
Variable	Variable to which the alarm will apply (the list of variables appears)								
Peripheral	Peripheral to which the alarm will apply (the list of peripherals appears)								
Recipient	Recipient to which the alarm will apply (the list of recipients appears)								
System	The reference does not appear								
Procedure	Only if the file type is different from None Call procedure applied to this alarm, available only if an alarm file exists.								

△ For an alarm to be able to be transmitted, an alarm recipient (see page 40) and a procedure (see page 46). must have been configured (in order). An alarm file must also be available (see Histories, page 36), even if a record is not wanted. Set the number of records to 1 in this case.

Configuration

Alarms

Type	The various alarm types are as follows:			
	Type	Source	Description	Associated parameters
	Less than	Variable	Alarm if the value of the variable is less than or equal to a threshold	Alarm threshold
	Greater than	Variable	Alarm if the value of the variable is greater than or equal to a threshold	Alarm threshold
	Equal to	Variable	Alarm if the value of the variable is equal to a state or a threshold (<i>parameter to be selected for a logical variable</i>)	Alarm threshold or state
	Regular	Variable	Transmission of the value of the variable at a fixed period	Call period. Time of next call
	In the range	Variable	Alarm if the value of the variable is within a limited range (limits included)	Low threshold and high threshold of the range
	Outside the range	Variable	Alarm if the value of the variable is outside the range (limits excluded)	Low threshold and high threshold of the range
	Discrepancy	Variable	Alarm if difference between the value of the "Reference" variable and that of the "Discrepancy" variable	Discrepancy variable, absolute deviation or relative deviation (as %). (the absolute deviation has priority)
	Different	Variable	Alarm if the value of the variable is different from the value of the threshold	Threshold
	Peripheral	Device	Alarm whenever the specified peripheral fails	Name of peripheral
	Blacklisted No.	Recipient	Alarm whenever the direction is blacklisted ("Blacklisted number" status). It is recommended to configure all the recipients in alarm on blacklisted No. (cf. chapter on "Alert recipients")	Name of recipient
	Max. No. of failures on No.	Recipient	Alarm whenever the direction takes the "Max. failures reached" status (cf. chapter on "Alert recipients")	Name of recipient
	Acq. failure on No.	Recipient	Alarm whenever the direction takes the "Acknowledgement failure" status (cf. chapter on "Alert recipients")	Name of recipient
	Failure on No.	Recipient	Alarm integrating the previous three faults on Recipient. Alarm whenever the direction takes the "Blacklisted number" or "Max. failures reached" or "Acknowledgement failure" status (cf. chapter on "Alert recipients")	Name of recipient
	Cyclic call	System	Cyclic call alarm at fixed period	Call period; time of next call
	Start-up	System	Alarm at each start-up of the Xflow software	None
	Stoppage	System	Alarm at each stoppage of Xflow	None
	Modem fault	System	Alarm whenever a modem type link is in initialization fault (the modem no longer responds correctly to the initialization strings sent by Xflow)	None
	Variable not refreshed	All	If a refreshment time has been defined for the variable and this time is exceeded by 30% then an alarm is tripped	None
	Cycl_File	System	Performs the same functionality as the cyclic call and adds the possibility of attaching a measurement file (the recipient must necessarily be an FTP server)	None

Occurrence time delay	<i>Only for alarms relating to a variable.</i> Time in seconds after which, if the value of the variable is still active, the alarm is tripped. Allows alarm filtering.
Formula on appearance	Calculation formula executed on tripping of the alarm
Time lag on disappearance	<i>Only for alarms relating to a variable.</i> Time in seconds after which, if the value of the variable is no longer in alarm, the alarm returns to normal.
Formula on disappearance	Formula executed upon return to normal
Hysteresis	<i>Only for alarms relating to a variable.</i> Delta to be added or removed from the value to trigger a return to normal. This makes it possible to prevent the phenomenon of oscillation from the of the threshold value. <i>Example:</i> you have configured a “Greater than” alarm with as threshold 20 (the alarm is tripped when the variable exceeds 20) and a hysteresis of 2. The return to normal will take place when the variable falls below 18.
Response time delay	Time delay which, if the alarm is still active, will cause recording of a new alarm
Inhibition alarm	Alarm which, if it is active, prevents tripping of the configured alarm
Class	Used for certain alert media, and in particular for PCText (in the case of an application with TELYO, fill in with 2 characters identifying the alarm) Is also used for routing of the alarm via a central station (Xflow Alarm). The maximum number of characters accepted is 20.
Severity	Alarm level: critical, minor, indication. Indication transmitted to the KERWIN central station, allows hierarchic organization of alarms. Also used by the hardware display.

 **To prevent any nuisance tripping of alarms, it is recommended to lock them during system configuration.**

Introduction

Xflow variables (of the input/output type) can adopt states or values according to time slots. These time slots are defined in weekly programs, which can themselves be associated with yearly programs.

The weekly and yearly programs are associated with variables via calculation formulae.

Dynamic control of weekly programs

Name	Current value	Current range	Next value	Next range	Delay
Surveillance	0 - Stop	DEFAULT	1 - Start	P1	1h 36mn

[show the yearly programs] [add a weekly program]

Names of the various timetables

Current value of timetable

Current time slot. DEFAULT means that we are outside of any configured time slot, and that the current value is that which was defined by default

Next value at the end of the current time slot

Name of the next time slot

Time delay before the next value

Configuration of a weekly program

Principle:

- 1 - Choose a default state
- 2 - Define time slots for the other state(s).

Name	Names the weekly programme with a customizable title. Define a clear name allowing unambiguous identification of the variable for the remainder of configuration. Choose a short name, without any space or punctuation characters . <i>Each name must be unique. No other variable, nor any other weekly program, nor any other yearly program, should have the same name, or else errors could be generated in the calculation formulae, because the formulae use the names in their syntax.</i>
Unit	This unit allows a title to be associated with the value of the timetable. In the case of writing on a peripheral (in Modbus, for example), the unit adopts the following values: First unit = 0 (e.g. comfort) Second unit = 1 (e.g. lowered) Third unit = 2 (e.g. above freezing level).
Default value	Defines the value taken by the weekly program if no time slot corresponds to the current date (by date is meant date and time)
<i>The following fields are not configurable, they provide information on the status of the weekly program.</i>	
Current value	Indicates the value of the weekly program at the current date
Current time slot	Indicates the active time slot, i.e. that for which the criteria of validity (start time, end time, days of the week) correspond to the current date. If no time slot corresponds to the current date, the current time slot appears as "DEFAULT" and the weekly program takes the default value defined previously. If several time slots correspond to the current date, the first of the declarations in order will be selected.
Next value	Indicates the value at the end of the current time slot
Next time slot	Indicates the next active time slot. Like for the current values, if several time slots correspond, the first of the definitions in order will be selected. If no time slot corresponds, the "DEFAULT" time slot will be selected.
Time delay before change	Documents the time remaining before changeover to the next time slot

Time slots

A time slot is said to be **active** when the current date is one of the days selected in the time slot and when the current time is in a range between the start time and the end time.

Name	Names the time slot with a customizable title. Define a clear name allowing unambiguous identification of this time slot for the remainder of configuration. Choose a short name, without any spaces or punctuation characters .
Value	Documents the value that will be taken by the weekly program when this time slot is active. When a unit is associated with the timetable, the list of titles of the unit is proposed.
Active days	Check the days during which this time slot will be active
Start time/End time	Documents the times during which the time slot will be active. If one wants 2 time slots to follow one another without interruption, there must be a difference of 1 minute between the end of time slot and the start of the following time slot. <i>Example:</i> End of time slot: 20 :59 Start of following time slot: 21 :00 When the end of time slot time is earlier than the start of time slot time, the time slot continues on the day after the selected day until the end of time slot time. <i>Example:</i> Start time = 23 hours End time = 08 hours Selected days = Saturday and Sunday The time slot will be active from 23 hours on Saturday to 08 hours on Sunday and from 23 hours on Sunday to 08 hours on Monday.

Assignment of weekly program to the variable

In configuration of the variable:

Calculation formula	Write the name of the timetable (complying with the same syntax)
----------------------------	--

Deletion of a time slot and a weekly program

To delete a weekly program, you must first delete all the time slots and check that this timetable does not appear in one of the yearly program time slots.

Example

A “Heater switch” variable, allowing control of heater operation, has been defined beforehand. It contains the “Start_Heater” calculation formula.

Site : xflow_demo
30/04/10 00:13:49 | Logout

Home page
Dashboard
Synoptics
Histories
Peripherals
Configuration

Home page → Configuration → Weekly programs → Prog. HVAC_CTRL

Name	HVAC_CTRL					[modify]
Unit	On/Off					
default value	On					
Current value	0 - On					
Current schedule	DEFAULT					
Next value	0 - On					
Next schedule	WEEK_MORNING					
Delay before changing	6h 47mn					

Schedule on this program
[\[add a range\]](#)

Name	Value	Active days	Start time	End hour
WEEK_MORNING	0 - On	Mon Thu Wed Thu Fri	7h00	11h59
WEEK_MIDDAY	1 - Off	Mon Thu Wed Thu Fri	12h00	13h59
WEEK_AFTERN	0 - On	Mon Thu Wed Thu Fri	14h00	17h59
WEEK_END_SAT	1 - Off	Sat	7h00	12h00

The heater is “On” on Monday, Tuesday, Wednesday, Thursday & Friday from 7 am to 11.59 am

The heater is in “Off” mode on weekdays, from 12 o'clock midday to 1.59 pm

The heater is “On” on weekdays, from 2.00 pm to 5.59 pm

The heater is “Off” on Saturday mornings (from 7.00 am to 12 o'clock midday).

Introduction

A yearly program allows weekly programs to be positioned on a yearly schedule:

- Day–night control of a device over one year
- Calculation of a set point value, etc.
- Simulator of annual pricing, etc.

A yearly program consists of one or more yearly time slots (without limitation).
The default weekly programme will be taken into account if no yearly time slot is valid.

Dynamic control of yearly programs

The screenshot shows the Schneider Electric configuration interface for yearly programs. The top navigation bar includes the Schneider Electric logo, site information (Site : InterSolar), and a language dropdown (English). Below the navigation bar, there is a breadcrumb trail: Home page → Configuration → Weekly programs. The main content area displays a table with the following columns: Name, Current value, Current range, Next value, Next range, and Delay. The first row of the table shows the values: Surveillance, 0 - Stop, DEFAULT, 1 - Start, P1, and 1h 17mn. Below the table, there are callouts explaining each column: 'Names of the various yearly programs' points to the Name column; 'Current value of yearly program' points to the Current value column; 'Current time slot. DEFAULT means that we are outside of any configured time slot, and that the current value is that which was defined by default' points to the Current range column; 'Next value at the end of the current time slot' points to the Next value column; 'Name of the next time slot' points to the Next range column; and 'Time delay before the next value' points to the Delay column.

Configuration of a yearly program

Name	Names the yearly programme with a customizable title. Define a clear name allowing unambiguous identification of the variable for the remainder of configuration. Choose a short name, without any space or punctuation character . <i>Each name must be unique. No other variable, nor any other weekly program, nor any other yearly program, should have the same name, or else errors could be generated in the calculation formulae, because the formulae use the names in their syntax.</i>
Default weekly program	Defines the weekly program that will be selected if no yearly time slot corresponds to the current date (by date is meant date and time).

The following fields are not configurable, they provide information on the status of the yearly program.

Current value	Indicates the value of the yearly program at the current date.
Current yearly time slot	Indicates the active weekly time slot, i.e. that for which the criteria of validity (day of the year) correspond to the current date. If several yearly time slots correspond to the current date, the first of the declarations in order will be selected. If no time slot corresponds to the current date, the current yearly time slot appears as "DEFAULT" and the yearly program takes the value of the default weekly program defined previously.
Next value	Indicates the next value of the yearly program
Next yearly time slot	Indicates the next active yearly time slot. Like for the current time slots, if several time slots correspond, the first of the definitions in order will be selected. If no time slot corresponds, the "DEFAULT" time slot will be selected.
Time delay before change	Documents the time remaining before changeover of the current weekly program

Yearly time slots

A yearly time slot is said to be **active** when the current date is in the range between the start date and the end date.

Name	Names the yearly time slot with a customizable title. Define a clear name allowing unambiguous identification of this time slot for the remainder of configuration. Choose a short name, without any space or punctuation characters .
Weekly program	Documents the weekly program that will be followed by the yearly program when this time slot is active
Start date/End date	Documents the dates during which the yearly time slot will be active

Deletion of yearly time slots and yearly programs

To delete the yearly program, you must first delete all the yearly time slots.

Example

A “Heater switch” variable, allowing control of heater start-up, has been defined beforehand. It contains the “Stop heater” calculation formula.



Site : InterSolar

12/10/09 12:10:32 | [Logout](#)

[Home page](#) | [Dashboard](#) | [Synoptics](#) | [Histories](#) | [Peripherals](#) | [Configuration](#)

Home page → Configuration → Weekly programs → Prog. Heater

Name	Heater		[modify]
default value	Start_Heater	←	The “Start Heater” weekly program will be applied outside of the time slots
Current value	1 - Stop		
Current schedule	Vacation		
Next value	1 - Stop		
Next schedule	Default		
Delay before changing	3d 11h 50mn	←	The heater will go to lowered in 3 days 11h 50 min

Schedule on this program

Name	Value	Start time	End hour
Vacation	Stop	01 / May	15 / October

The “Stop Heater” weekly program will be applied from 1st May to 15 October

[\[add a range\]](#)

Introduction

The Xflow dashboards allow real-time checking of the system's operation. They display on various pages the standard values of the various variables.



Site : xflow_demo30/04/10 00:15:54 | Logout

Home pageDashboardSynopticsHistoriesPeripheralsConfiguration

Home page → Configuration → Dashboards

Name	Description
RPT_PTR	Poste de Transformation
INV1_MONIT	Xantrex No1- Monitoring
INV1_PARAM	Xantrex No1- Parametres
INV1_CONFIG	Xantrex No1- Configuration
INV2_MONIT	Xantrex No2- Monitoring
INV2_PARAM	Xantrex No2- Parametres
INV2_CONFIG	Xantrex No2- Configuration
Array_Box1	Array Box No1- Mesures
Array_Box2	Array Box No2- Mesures

[add a dashboard]

Configuration of a dashboard

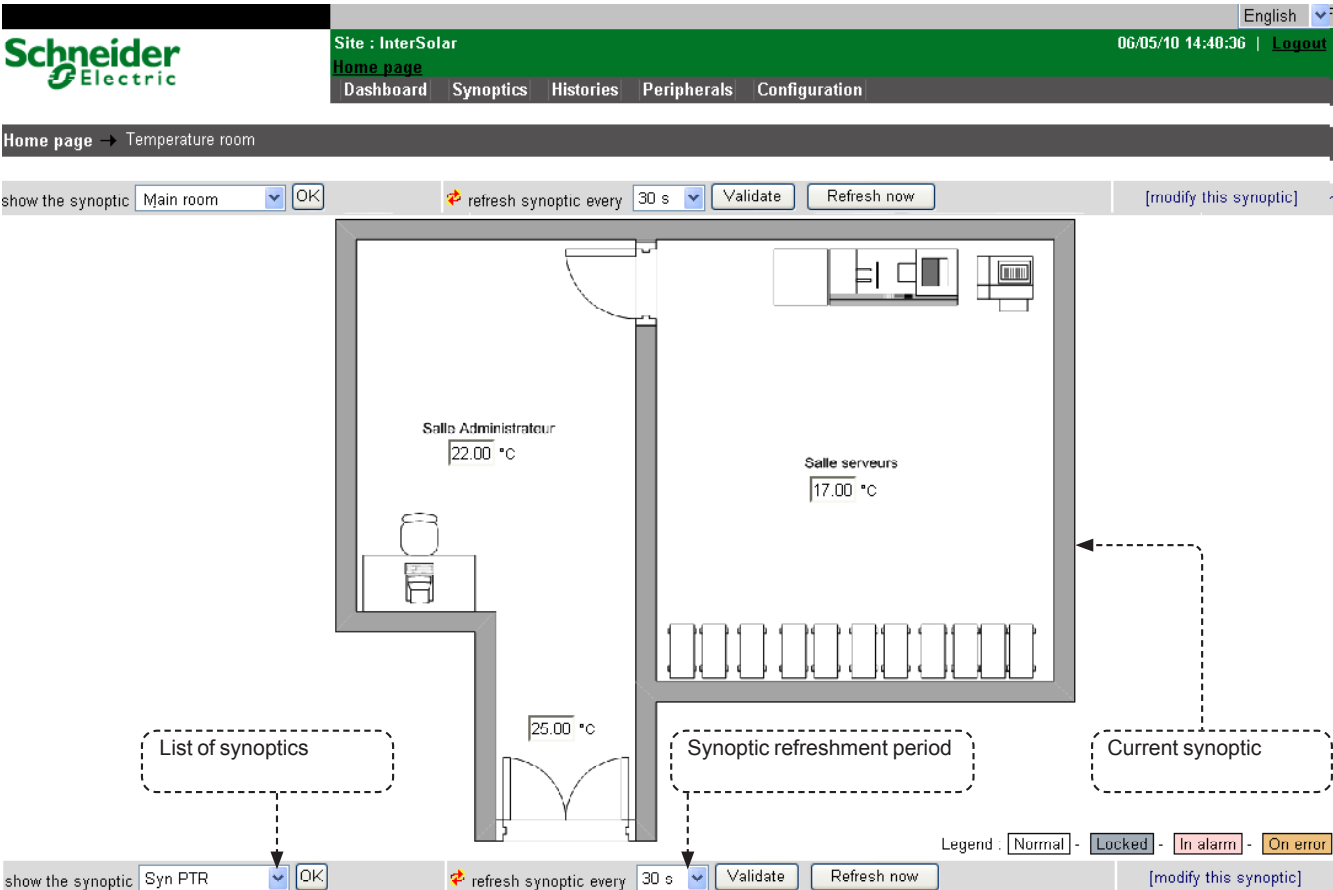
Name	Names the dashboard with a short customizable title
Description	Description which appears in lookup, it is important that it be explicit
Variables	Select from the list the variables that you want to add to your dashboard. It is also possible to add to an existing dashboard from a variable configuration screen, by clicking on: List of configured dashboards Insert inPTROK

Introduction

The Xflow synoptics, like the dashboards, allow real-time monitoring of the system's operation.

They consist of a background image (".jpg" or ".gif" file, for example) on which are placed the variables. The state of the variables is shown either alphanumerically or by a graphic.

Unlike all the other configurations, the synoptics are configured directly from the lookup page:



Configuration of a synoptic

Name	Names the synoptic with a short customizable title.
Description	Description which appears in lookup, it is important that it be explicit.
Background image	The image file should first have been loaded into Xflow. See in chapter 7 "Maintenance". The image file should be as small as possible to enable a fast display: < 20 kB
Variables	Click on: add a variable v The value of the selected variable will be positioned in the top left-hand of the background image. It need merely be dragged with the mouse to position it in the wanted location. <i>A given variable cannot be positioned several times on the same synoptic.</i>
Logical state image	In the case of a variable associated with a logical unit, by selecting yes, you can display an image instead of the title. The image must bear the name of the title with the .gif extension. For example, a variable with the no/yes unit will display the yes.gif or no.gif image depending on its value. See chapter 7 "Maintenance" to know the location of the image files on the disks.
Deleting a synoptic	A synoptic can be deleted only if all the variables have been deleted beforehand

Introduction

Advanced settings allows a number of parameters to be configured, such as:

- Units
- Name and phone number of the site
- Users
- The time
- Filtering on incoming calls.

It also makes it possible to see a number of system parameters, such as available memory, the software release number, serial number of the device, etc....

User settings

Name	User name (name used at logon)	
Password	Enter a password for the user	
Confirmation of password	Re-enter the user password	
Type	Administrator	He has all rights
	Configurator	He has all rights in configuration mode, but does not have access to Advanced Settings.
	Operator	He cannot configure the device. On the other hand, he can obtain access to the dashboards, change set point values, and acknowledge alarms.
	Consultant	He can only view the histories and dashboards, without any possible control
Profile	Web profile of the user. By default, the "NAPAC" profile is used. It is possible to route a user to personalized XML pages (requires special development, contact us).	
Number of lines displayed per page	When the list content is displayed, makes it possible to specify how many lines you want to display simultaneously before seeing the "Next page" navigation button appear	

Unit settings

By default, a list of logical and analogue units is defined. It is possible to add new units by clicking on "Add".

Multi-state logical units

There is a special unit format allowing the display of a title rather than a value when looking up a logical or analogue variable.

The syntax of a logical unit is as follows:

/[[v]]lib/[[v]]lib[.....]

lib : title of the unit for a value ranging between the value of the preceding title and v.

v : max. value for the lib title (optional).

⚠ The initial value is 0 and, if v is not specified, it is incremented by 1 between each title.

Examples

/OFF/ON

- OFF is displayed if the value equals 0
- ON is displayed if the value is different from 0

/DAY/NIGHT/WEND

- DAY will be displayed if the value equals 0
- NIGHT will be displayed if the value equals 1
- WEND will be displayed for all other values

/[5]ON/[10]OFF/AUTO

- ON will be displayed for $v \leq 5$
- OFF will be displayed for $5 < v \leq 10$
- AUTO will be displayed for $v > 10$

Configuration of filters on incoming calls

It is possible to prohibit access to the system for certain phone numbers, Xflow identifying the incoming calls before opening the line ("clip" function).

There are two ways to make filters:

- Either all phone numbers are authorized by default, except those appearing in the list.
- Or no phone number is authorized by default, except those appearing in the list.

To change this behaviour, simply click on the "Block all numbers by default" button or "Authorize all numbers by default", depending on the case.

Name	Name given to this filter
Filter	Phone number to be filtered. This number can begin with *. In this case, all numbers ending with the figures following the asterisk will be filtered. This number can also end with *. In this case, all numbers starting with the figures before the asterisk will be filtered.

⚠ If the Xflow telephone line is a PSTN line (Public Switched Telephone Network) and does not have the "Caller ID" service (CLIP), it is absolutely essential to leave the default settings in this page, namely: **Authorize all numbers by default and no filter programmed**. Otherwise, Xflow could no longer be reached via a telephone network.

⚠ If immediate line opening is wanted, you must make sure to set the number of ringing tones to 1 in the corresponding link.

Configuration of Modbus addresses

It is possible to assign a Modbus slave address to each of the variables configured in Xflow.

This allows a supervisor, or any other Modbus Master, to read or change the values of the variables managed by Xflow.

Variable	List of Xflow variables in order to select the variable to be assigned a Modbus address.
Slave address	Modbus address to be assigned a variable. ⚠ Here it is possible to give the same Modbus address to different variables. That would then cause unexpected behaviour. It is up to you to ensure that the selected address is unique.
Reading format	Defines the reading format for the variable, from: ■ boolean Bit, logical value (0 or 1) ■ word 16-bit word, unsigned integer value from 0 to 65535 ■ word [i] 16-bit word (cf. "word"), inverted ■ dword 32-bit word, unsigned integer value from 0 to 4294967295 ■ dword [i] 32-bit word (cf. "dword"), inverted ■ IEEE Floating point, single precision decimal value (with decimal point) ■ IEEE [i] Floating point (cf. "IEEE"), inverted ■ IEEE [sw] Floating point (cf. "IEEE"), swapped ■ IEEE [i sw] Floating point (cf. "IEEE"), inverted and swapped ■ DIEEE Floating, double precision decimal value
Write enabled	Defined if the variable is accessible in read or in read/write. If the variable is configured as read-only (via the configuration of variables), the field is transformed into "Writing disabled" and takes the value <i>"read-only variable"</i> .

⚠ A reading format **[i]** is said to be inverted because during the sending or reception of data of this type, the byte arrangement is in Big Endian (most significant byte first). Xflow must therefore convert it to Little Endian, the standard format used.

Example:

word [i] = b[8-15] b[0-7] Big Endian
word = b[0-7] b[8-15] Little Endian

⚠ A reading format **[sw]** is said to be swapped because during the sending or reception of data of at least 4 bytes, the first word consists of the 2 most significant bytes in Little Endian and the second word consists of the 2 least significant bytes in Little Endian. Xflow must therefore invert the 2 words to regain a standard notation system.

Example:

IEEE = b[0-7] b[8-15] b[16-23] b[24-31] Little Endian
IEEE [sw] = b[16-23] b[24-31] b[0-7] b[8-15] Big Endian for the words,
Little Endian for the bytes
in the words

System settings

Title in the System page	Key word in the System table name field	Description
Name	NAME	Reference name of the site
Phone number	PHONE	Phone number of the site, if it has one. <i>Optional</i>
HTTP port	HTTP_PORT	http port of the Web server. By default, the Web server is on the standard port 80. You can change it, if you have another Web server that is already running on your computer (for the version on PC). <i>Optional</i>
IP address	IP_ADDRESS	IP address of the computer, address which makes it possible to be polled on an Ethernet network in TCP/IP. By default, the devices are supplied with the IP address 172.16.1.250 (except for Xflow on PC). If you change this address, it is necessary to reset the computer for the new IP address to be taken into account.
IP mask	IP_MASK	Sub-network mask relating to the IP address. <i>Optional</i>
Default gateway	GATEWAY	IP address of the computer that will be used to route all frames that are not intended for a computer on the local sub-network. <i>Optional</i>
Modbus slave address	MODBUS_ADDR	Slave address of Xflow By default at 10
Current date		Update of the date and time
Phone number	ISP_PHONE	Phone number of your Internet connection (see access provider) (for email recipients via PPP)
Logon name	ISP_USER	Name of your Internet connection (see access provider) (for email recipients via PPP)
Password	ISP_PASSWORD	Password of your Internet connection (see access provider) (for email recipients via PPP)

All these settings are taken into account when you press on **“Save system settings”**.

Other system settings not appearing in the system page (accessible via the “Database” page or using Kervisu)

HTTP_DEFLATE	Web data transmission in compressed mode to browsers supporting this functionality (e.g. Internet Explorer). This compression reduces the size of the data to be transmitted, but takes calculation time from Xflow. This mode can be used when the telephone lines do not enable high connection speeds (28800 bps). <i>Value from 0 (no compression by default) to 9, maximum compression rate</i> <i>Optional</i>
DEF_CALL_FILTER	Sets the filter mode for calling party numbers. With the Web interface, this setting should not be changed directly. It is configured automatically from the page for configuration of filters on incoming calls (cf. section on Configuration of filters on incoming calls in this same chapter). 1: (default value): all numbers are authorized except those that might be configured in the list of filters. 0: all numbers are blocked except those that might be configured in the list of filters. <i>Note: if the Xflow telephone line does not have a “Caller ID” service (CLIP), it is absolutely essential that this setting have the value 1. Otherwise, Xflow could no longer be reached via a telephone network.</i>
DATEFORMAT	Format for display of dates in the Web interface of Xflow: The default format is: d/m/y H:M:S (d: day; m: month; y: year; H: hour; M: minute; S: second) <i>For example, if you want to display the dates in US format, enter the value m/d/y H:M:S for this setting.</i> <i>Optional</i>
ISP_INIT_MODEM	Allows an initialization string to be given to the modem for calls to the Internet service provider (for email recipients via PPP). <i>Optional</i>
MAIL_SERVER_PORT	HTTP port of the EMAIL server called for transfer to email recipients. By default, the email servers are on the standard port 25. <i>Optional</i>

DBSPERIOD	Configurable backup period: The configuration backup period (xflow.wst) can be set at between 5 minutes and 720 minutes (12 hours). To configure this, add a "DBSPERIOD" line in the system table, and indicate the period value wanted. Restrictions: Where there is no such line, the default period is 5 minutes. A value outside of the 5-720 range is refused. In that case the default period is retained.
DNS_SERVER	Name of the DynDNS service to which one has subscribed. The DynDNS service allows an IP address to be converted into a computer name, more easily identifiable on Internet when the IP address of Xflow changes frequently.
DNS_HOSTNAME	Name of the computer as it will be seen by the DynDNS service
DNS_USERNAME	Name of the DynDNS account
DNS_USER_PASSWORD	Password of the DynDNS account

System information

Free memory of the system	Free memory for the system in bytes
Database free memory	Free memory for your configuration
Software release	Xflow software release
Number of variables	Number of variables supported by Xflow for this release
Serial number	Serial number of your Xflow
Operation counter (in sec)	Operating time since last restarting, in seconds

System commands

System stoppage	Only on the Xflow version for PC, allows the Xflow application to be stopped
System reset	Allows the Xflow software to be stopped, then started again automatically
Booting	Allows the device to be booted for maintenance operations. This function is reserved for Schneider Electric technicians.
Configuration backup	The current configuration is saved to the Xflow.wst file. Without a deliberate backup action via this menu, the current configuration is saved only every 5 minutes. ■ iRIO: "SRAMDISK" directory. ■ PC (NT): "Temp" directory, located in the directory containing Xflow.exe.
Config. backup in CST	Same as before but in the Xflow.cst file (see meaning in chapter 7 "Maintenance") The .cst file is a non-compacted configuration file (unlike the .wst file) which allows system restarting at rebooting, in the event of loss of or damage to the current .wst configuration file.

Database

This menu gives overall access to all the Xflow configuration parameters.

⚠ Changes in the database should be done with great caution and should be performed only by people who are perfectly aware of the implications of such changes.

Introduction

The calculation formulae allow arithmetical and combinational operations between **variables, alarms, histories and programs**.

They thus make it possible:

- To perform mathematical calculations from physical measurements (consumption, forecasts, conversions, etc.)
- To define automatic command and setting controls (load shedding, indications, pumping, etc.)
- To adjust the configuration of Xflow (counter resetting, override setting of the value of a variable, assignment of a database cell, etc.).

A formula can be associated with:

- A variable; in that case it is executed at each acquisition cycle
- An alarm; in that case it is executed upon an event at appearance or disappearance of the alarm.

Syntaxes and rules

The formulae use a natural and intuitive syntax combining references to measurement values (variables, historic data, etc.), literal expressions (constants, operators, etc.) and invocation of functions (min., max., delta, etc.).

The user does not have to worry about data formats, the interpreter takes care of conversions, and it is thus possible to combine logical and arithmetic operations: $(B > 3) * C$, $(B > 3)$ is a logical expression (true (1) or false (0)).

The formulae are meaningful only if, following their execution, the value obtained is assigned to a variable (or to a database cell). It should be clearly understood that a **formula is not a script language**, there is no concept of loops (for, while) nor instruction skips (goto, if..then). However, there is a conditional operator which allows such or such a value to be assigned based on a logical expression.

The formulae do not take into account the case (lower case or upper case) of the operands and functions. The maximum length of a formula is **512 characters**. The maximum number of tokens supported in a formula is limited to 50. A token is defined by an operator or an operand, including the "+", "-", "/", "[", "]" operators, etc. A formula can be split into several "sub-formulae" separated by a **semi-colon (the comma is reserved to separate the parameters of a function)**.

Each "sub-formula" is executed in succession in its order of writing during a given processing cycle.

Operands

Numerical constants (integers, decimal numbers)

The numbers can be positive and negative, integers or decimals and/or with exponent: 123, -45.1, 12.5E3, etc.

To enter a number in hexadecimal, its value must be prefixed by the \$ symbol (or the letter H), e.g. \$10 (or H10).

For "decimal" values, the decimal separator is the dot.

The type of value (integer, word, IEEE) is automatically determined by analysis of the formula.

Character strings

A character string must be entered between apostrophes ', for example 'my string'.

Character strings are used to reference certain function parameters or else names of tables or columns in the database.

Variables

By entering the name of a **variable** (without apostrophes), the operand will be interpreted as the **value of the variable** at the time of execution. The value type is that of the variable.

Alarms

By entering the name of an **alarm** (without apostrophes), the operand will be interpreted as a **Boolean value** which equals true (1) if the alarm is in progress at the time of execution, or otherwise false (0).

Weekly programs

By entering the name of a **weekly program**, the operand will be interpreted as its **current value** at the time of execution.

Yearly programs

By entering the name of a **yearly program**, the operand will be interpreted as its **current value** at the time of execution.

Note:

Reading what precedes, it will be understood that it is important to enter unique names during the configuration of Xflow in order to resolve any ambiguity, for example if an alarm has the same name as a variable...

For each operand of a formula, the search is performed in the following order:
Variables > Alarms > Weekly Prog. > Yearly Prog. > Numerical constants

Operators

Arithmetic

+	Addition
-	Subtraction
*	Multiplication
/	Division (division by zero causes an execution error)
%	Modulo: remainder of division of integers (whole numbers)
**	Power: $A^{**}B = A^{\text{exponent } B} = A^B$

Logical

&&	Logical AND	$A \& \& B = \text{true if } A = \text{true AND } B = \text{true, else false}$
	Logical OR	$A B = \text{true if } A = \text{true OR } B = \text{true, else false}$
##		
^^	Logical XOR (exclusive OR)	$A \wedge \wedge B = \text{true if } (A = \text{true AND } B = \text{false})$ $\text{OR } (A = \text{false AND } B = \text{true})$
!	Logical NOT	$!A = \text{true if } A = \text{false}$

Note: the "!" symbol is obtained by pressing the [AltGr] and [6] keys on the keyboard simultaneously

Binary

&	Bitwise AND	$\$AA \& \$55 = \$00$
	Bitwise OR	$\$AA \$55 = \$FF$
#		
^	Bitwise XOR (exclusive OR)	$\$AA \wedge \$A5 = \$0F$
~	Bitwise INVERSION (1's complement)	$\sim A$, inverts all the bits of A ; those at 1 go to 0 and vice versa
<<	Left shift	$A \ll B$, shifts the bits of A by B bits to the left
>>	Right shift	$B \gg A$, shifts the bits of A by B bits to the right

Comparisons

=	Equal to
==	
!=	Different from
<>	
>	Greater than
<	Less than
>=	Greater than or equal to
<=	Less than or equal to

The assignment operator

The operator **:=** allows a value to be assigned to a variable or a cell of the database:
myvar := 2 or *mytable [1, 2] := 1*.

The user does not have to worry about the destination data format, conversions are automatic.

In the case of a variable on an input/output peripheral, an assignment will cause a write order to be sent to the peripheral when the formula is executed.

The conditional operator

The operator $(expr) ? A : B$ returns A if $expr$ is *true*, else B .
 $expr$ must be a Boolean expression.

For example:

$A := (B > C) ? D : E$; will assign D to A if B is greater than C , else will assign E to A .

It is of course possible to use brackets to build more complex expressions.

Likewise in an operation:

$A + ((B > C) ? D : E)$ equals $A + D$ if $B > C$, else it equals $A + E$.

The conditional operator can also be used for an assignment:

$((B > C) ? D : E) := A$; in this case, if $B > C$, D is assigned the value A , else it is E that is assigned the value A .

Order of priority of operators and use of brackets

The decreasing order of priority in execution of the operations of an expression is as follows:

Function	Fcn()	P0 = max. priority
Positive sign	+(Var)	P1
Negative sign	-(Var)	
Logical NOT	!	
1's complement *	~	
Power	**	P2
Multiplication	*	P3
Division	/	
Remainder *	%	
Addition	+	
Subtraction	-	P4
Left shift *	<<	
Right shift *	>>	
Bitwise AND *	&	
Bitwise OR *	or #	P5
Bitwise XOR (exclusive OR)	^	
Logical AND	&&	
Logical OR	or ##	
Logical XOR (exclusive OR)	^^	P6
Test equal to	=	
Test less than or equal to	<=	
Test greater than or equal to	>=	
Test less than	<	
Test greater than	>	
Test different from	!= ou <>	
Assignment	:=	P7 = min. priority

Measurement histories

The value of a variable saved in a measurement file can be accessed in a calculation formula by the syntax: *filename[column,record]*

<i>filename</i>	Name of the file in which the value should be read
<i>column</i>	Number of the column to read in the file column 0 corresponds to the date of recording
<i>record</i>	If this parameter is of the TIME_T, type, it corresponds to the date of the record to be read, else it corresponds to the position of the record to be read. 0 is the last record (the most recent), 1 the second-to-last, etc.

Database

The value of a database cell can be accessed in a calculation formula by the syntax: *tablename[row,column]*

<i>tablename</i>	Name of the table in which the cell should be read (cf. Advanced Settings/Database)
<i>row</i>	If this parameter is a character string (surrounded by apostrophes '), it designates the name of the line to be read. If this parameter is a numerical value, it designates the position of the row to be read. The first line is in position 0.
<i>column</i>	If this parameter is a character string (surrounded by apostrophes '), it designates the name of the column to be read (cf. Advanced Settings / Database). If this parameter is a numerical value, it designates the position of the column to be read. The first column is in position 0.

The value type corresponds to the recording format of the column.

Functions

The arguments of functions can be all sorts of operands indistinctly, but also arithmetic or logical expressions or else results of functions.

Accordingly, it is possible to nest several function and operation invocations.

“,...)” : the three dots designate functions with a variable number of arguments.

“[x]” : the square brackets designate one (or more) optional argument(s).

Mathematical functions

Unless otherwise specified, the data format of the values returned by these functions is DIEEE (floating point double precision).

abs(x): returns the absolute value of its argument x

The data type returned by the function is the same as that of x.

Example: `abs(VAR1*3)`

sqrt(x): returns the square root of x.

If x is less than zero, the operation causes an error at execution.

Example: `sqrt(16)`

log(x): returns the Napierian logarithm of x.

If x is less than or equal to 0, the operation causes an error at execution.

Example: `log(10)`

log10(x): returns the decimal logarithm of x.

If x is less than or equal to 0, the operation causes an error at execution.

Example: `log10(16)`

exp(x): returns the exponential of x. $\exp(\log(x)) = x$.

Example: `exp(12)`

pow(x,y): returns x to the power y. $\text{pow}(x,y) = x^y = x^y$.

Example: `pow(2,3)`

intg(x): returns the integer part of x.

The value returned is of integer type (INT32).

Example: `intg(12.46)`

rand(x): returns a random integer greater than or equal to 0 and less than x.

The value returned is of double word type (DWORD).

Example: `rand(1000)`

Trigonometric functions

The data format of the values returned by these functions is DIEEE (floating point double precision).

sin(x): returns the sine of the angle x expressed in radians.

Example: `sin(90)`

cos(x): returns the cosine of the angle x expressed in radians.

Example: `cos(90)`

tan(x): returns the tangent of the angle x expressed in radians.

Example: `tan(90)`

asin(x): returns the arc-sine of x. The result is between $-\pi/2$ and $+\pi/2$ radians.

X must be greater than or equal to -1 and less than or equal to $+1$.

Example: `asin(90)`

acos(x): returns the arc-cosine of x. The result is between 0 and π radians.

X must be greater than or equal to -1 and less than or equal to $+1$.

Example: `acos(90)`

atan(x): returns the arc-tangent of x. The result is between $-\pi/2$ and $+\pi/2$ radians.

Example: `atan(90)`

sinh(x): returns the hyperbolic sine of x expressed in radians.

Example: `sinh(90)`

cosh(x): returns the hyperbolic cosine of x expressed in radians.

Example: `cosh(90)`

tanh(x): returns the hyperbolic tangent of x expressed in radians.

Example: `tanh(90)`

Statistical functions

mini(A,B, ...): returns the argument for which the value is smallest.
This function must contain **at least two** arguments.

Note that this function does not return only the value of the argument but also its reference. It is thus possible to combine with an assignment operation:

mini(VAR1, VAR2, VAR3) := 4 ; with VAR1, VAR2, VAR3 of the references on variables; if VAR3 has the minimum value, this variable will then be assigned the value 4.
Example: `min.(30,25,20,10,15,40,50)`

max.(A,B,...): returns the argument for which the value is largest.
This function must contain **at least two** arguments.

As for **min.**, this function returns the reference on the argument.
Example: `max.(30,25,20,10,15,40,50)`

pmin.(A,B,...): returns the position (from 0) of the argument for which the value is smallest. This function must contain **at least two** arguments.

Example: `pmin.(30,25,20,10,15,40,50)`

pmax.(A,B,...): returns the position (from 0) of the argument for which the value is largest. This function must contain **at least two** arguments.

Example: `pmax.(30,25,20,0,15,40,50)`

sum(A,B,...): returns the value of the sum of the arguments.
This function must contain **at least two** arguments.

Example: `sum(-4.25,-3)`

avg(A,B,...): Returns the value of the average of the arguments.
This function must contain **at least two** arguments.

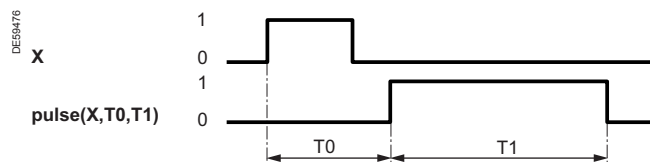
Example: `avg(5,10,15)`

Logical functions

pulse(X,T0,T1)

X is a Boolean variable. T0, T1 are numbers of seconds.

On the rising edge of X (transition from 0 to 1), after T0 seconds, the function returns *true* (=1) during T1 seconds. The rest of the time it returns *false* (=0).

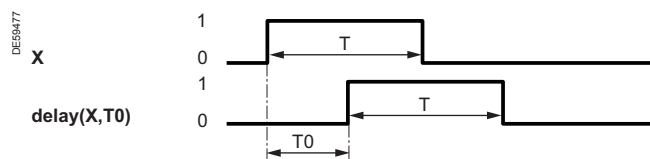


Example: `pulse(VAR,2,5)`

delay(X,T0)

X is a Boolean variable. T0 is a number of seconds.

The function replicates the value of X staggered in time by T0 seconds

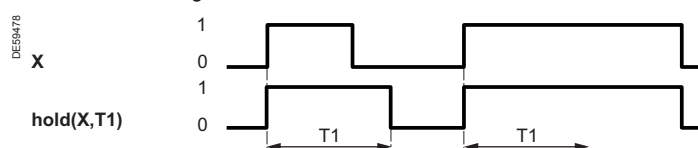


Example: `delay(VAR,5)`

hold(X,T1)

X is a Boolean variable. T1 is a number of seconds.

The function returns true during at least T1 seconds on the rising edge (transition from 0 to 1) of X. If X remains at 1 (*true*) for more than T1 seconds, the *hold* function returns *true* during this time.



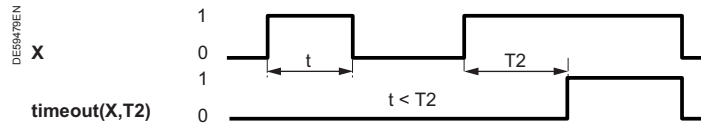
Example: `hold(VAR,5)`

timeout(X,T2)

X is a Boolean variable. T2 is a number of seconds.

The function returns *true* if X goes to 1 for at least T2 seconds.

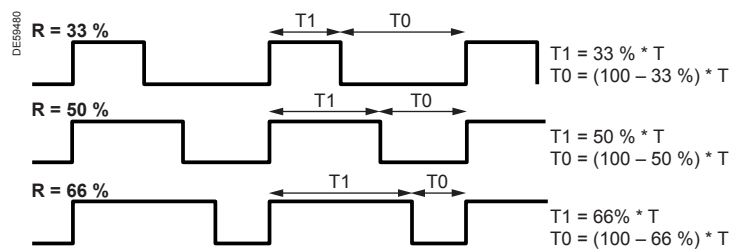
After this time, the function returns *true* so long as X is at *true*.



Example: `timeout(VAR,5)`

pwm(T,R)

The function returns a Boolean value at a rate of one time proportional signal (PWM, Pulse Width Modulation) of period T in seconds and of cyclic ratio R as a percentage. R must be in a range between 0 and 100%.



Example: `pmw(5,50)`

Time functions/Dates and times:

The TIME_T format is a data format which can be used to store in memory a date/time pair in number of seconds from a unique reference (1st January 1980 at 00:00:00).

The days of the week are associated with the following values: 1 = Sunday, 2 = Monday, 4 = Tuesday, 8 = Wednesday, 16 = Thursday, 32 = Friday, 64 = Saturday.

dt([T],X) or now([T],X)

With no argument, the function returns the current date and time in TIME_T.

With X only, the current date and time serve as a reference for the argument X

if X = 1 or 'Y', returns the year on 4 digits

if X = 2 or 'M', returns the month (from 1 to 12)

if X = 3 or 'D', returns the day of the month (from 1 to 31)

if X = 4 or 'H', returns the time on 24H (from 0 to 23)

if X = 5 or 'm', returns the minute (from 0 to 59)

if X = 6 or 's', returns the second (from 0 to 59)

if X = 7 or 'd', returns the day in the week (1, 2, 4, 8, 16, 32, 64 with Sunday = 1)

if X = 8 or 'p', returns 0 if the time is before midday (AM), 1 for the afternoon (PM)

if X = 9 or 'h', returns the time on 12H

if X = 10 or 'y', returns the year on 2 digits.

With T in TIME_T and X, T serves as a reference for the argument X.

T must be a TIME_T format mandatorily through the value of a time type variable or else returned by a function (for example, time()).

Example: `dt(VAR,'Y')`

Extraction of the year of the VAR variable of time type.

The function now() has been kept for reasons of compatibility between releases < 1.7 and release 1.7 of Xflow.
On the Xflow releases prior to 1.7, the now() function accepted only numerical arguments (1 to 7, plus 0 equivalent to "no argument" (to obtain the current date and time)).

The `isweek()` function replaces two functions, `wd()` and `week()`, of the Xflow releases < 1.7

The `wd()` and `week()` functions are no longer supported in version 1.7 of Xflow.

`time(X[,F])`

With X only, if X is a character string, the function converts into TIME_T the date and time corresponding to X based on the default date and time format. If X is a numeric, the function converts this number into TIME_T.

With X and F, X must be a character string; F is also a character string which defines the date and time reading format.

The function therefore returns the date X in TIME_T according to the F format.

F is of the form 'd/m/y H:M:S' with:

d = day in the month (from 1 to 31)

m = month in the year (from 1 to 12)

y = year on 2 digits

Y = year on 4 digits

H = time on 24H

h = time on 12H

M = minute (from 0 to 59)

S = second (from 0 to 59)

`isweek([X])`

If X is absent, the function returns the Boolean value true if the current date is a working day (from Monday to Friday inclusive).

If X is of TIME_T type, the function returns true if the date X corresponds to a working day. The date given by X shall mandatorily come from another variable of "time" type of a return of a "TIME_T" type function.

If X designates the number of a day in the week, the function returns true if the day X is a working day.

`deltats()`

Returns the time in SECONDS between two executions of the formula.

This function is very powerful, because it can be used to perform integrations, derivatives, etc.

It is based on the system's real-time clock.

Example: `deltats()`

`deltatms()`

Returns the time in MILLISECONDS between two executions of the formula.

This function is very powerful, because it can be used to perform integrations, derivatives, etc.

It is based on the quartz clock of the CPU. As a result, it is relatively imprecise in the long run.

Example: `deltatms()`

Other functions

`iswithin(X,min,max)`

Returns a Boolean value which equals true if ($X \geq min$) AND ($x \leq max$), else false.

Example: `iswithin(VAR, 1, 10)`

`bounds(X,min,max)`

Returns the value of X bounded by min and max.

If X is less than min, returns min; if X is greater than max, returns max; else returns X.

Example: `bounds(VAR, 1, 10)`

`delta(X)` or `deltav(X)`

Returns the difference between the value of X during the previous execution of the formula and the current value of X. The period for calculation of the X difference is therefore the period of execution of the formula. See also `deltats()` and `deltatms()`.

Example: `delta(VAR)`

`switch(X,A0,A1[,A2,...])` or `cond(X,A0,A1[,A2,...])`

Returns a value associated with the "symbolic" value of X.

X must be a positive or null integer value.

This function must contain at least three arguments.

If X = 0, the function returns the argument A0, if X = 1, returns A1, if X = 2, returns A2, etc.

If X < 0, the function returns the argument A0, if X is greater than the number of arguments, the last is returned.

Example: `switch(VAR,1,2,3,4,5)`

On Xflow releases 1.5 and 1.6, only the `deltav` function exists (`deltav()` has been kept for reasons of compatibility between releases < 1.7 and release 1.7 of Xflow).

On Xflow releases 1.5 and 1.6, only the `cond()` function exists with only 3 arguments (X, A0,A1) (`cond()` has been kept for reasons of compatibility between releases < 1.7 and release 1.7 of Xflow) In release 1.7, for if-else logical conditions, it is preferable to use the conditional operator (`(expr) ? A : B`).

Advanced functions

polynom(X,A0,A1[,A2,A3,...])

This function must contain **at least three** arguments.

The Ax arguments define the coefficients of a polynomial

$$A0 + A1X + A2X^2 + A3X^3 + \dots$$

The function returns the value of the polynomial thus described for the value X .

Example: `polynom(VAR,1,1,2)`

polyline(X,X0,Y0,X1,Y1[,X2,Y2,...])

This function must contain **at least five** arguments. Their number must be odd.

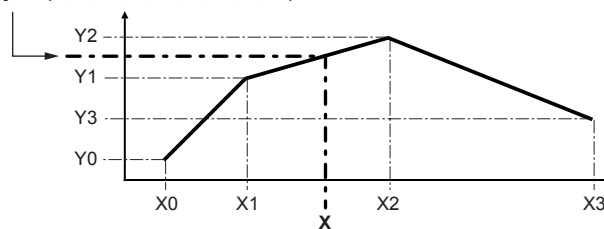
The values of $X0, X1, Xn$ must be defined in increasing order.

The points $(X0, Y0), (X1, Y1), (X2, Y2), \dots$ define segments of straight lines.

According to the value of X , the function returns the corresponding value in the broken curve thus defined.

polyline(X,X0,Y0,X1,Y1,X2,Y2,X3,Y3)

DE59481



Example: `polyline(VAR,1,1,2,2,3,3,4,4)`

pi()

Returns the value of "pi" (3,14159265358979...).

e()

Returns the value of "e" (2.718281828459045...).

reset(X,Y,Z)

Allows Xflow to be stopped and restarted in a given time with the possibility of saving the Xflow configuration file.

- X :** 0 Stoppage of Xflow
2 Reset of Xflow
3 Rebooting of the equipment which runs Xflow
- Y :** Time in milliseconds before execution of action X
- Z :** 0 No saving of the configuration (WST file) before action X
1 Saving of the configuration (WST file) before action X.

ackevt('recipient name')

The usefulness of this function is to provide the possibility of acknowledging alarms locally without having to log on to Xflow (with a PC for the Web interface or Kervisu) – by pressing a push button, for example.

To perform the acknowledgement function via a physical input, the specific resources required are as follows:

- **1 alarm recipient** with a fixed number of acknowledgement attempts (not automatic).
 - **1 physical input variable** (push button, for example) on which the alarm will be triggered.
 - **1 virtual variable** necessary only to store the result of the alarm acknowledgement calculation formula.
 - **1 alarm** on the acknowledgement input variable from which will be run the formula for acknowledgement of the alarms of a recipient. This alarm is linked to no file and targets the physical input variable.
- The formula takes as a parameter the name of the alarm recipient and assigns the virtual variable.

Introduction

A report is a set of information collected on Xflow that can be sent to one or more recipients via various types of media (email or FTP) over various communication networks (Ethernet, telephone network or GSM).

A report is a file (e.g. Report_Xflow_SET.XLS).

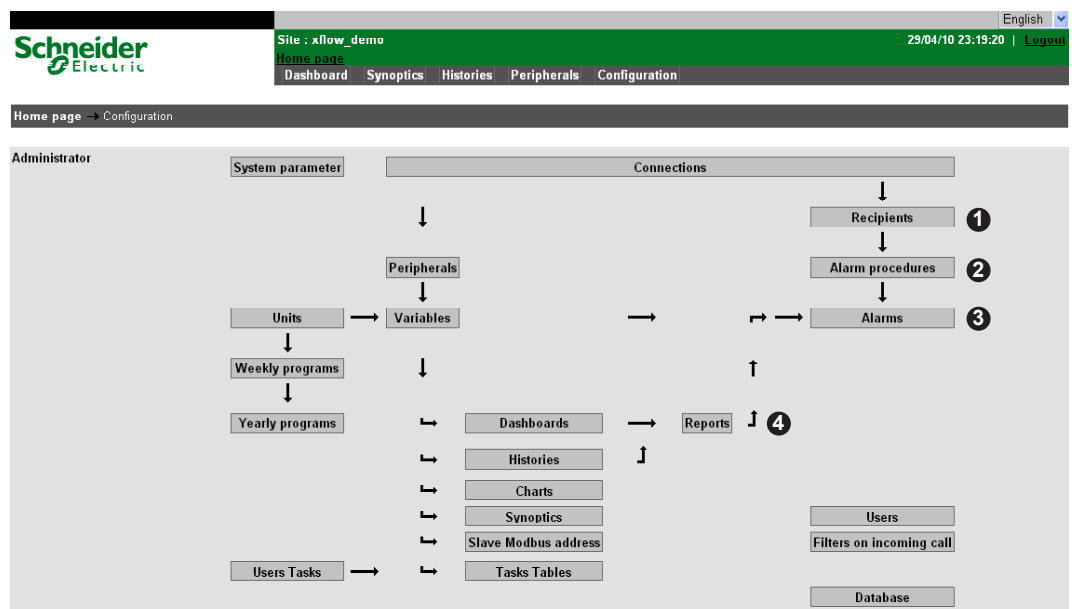
Reports have two advantages: they can interface both with information systems and with users.

Reports are available from Xflow release 1.9 on, and on all platforms (PC, iRIO, etc.).

Configuring a report

Before configuring a report, you must ensure that you have defined:

- The recipient(s) (FTP or email) of the report
- The procedure for calling the recipient(s)
- The alarm or alarms that will then be associated with the report to allow their triggering.



Configure a report (from the Configuration menu, select Reports)



Site : InterSolar

06/05/10 15:04:54 | [Logout](#)

[Home page](#)
[Dashboard](#)
[Synoptics](#)
[Histories](#)
[Peripherals](#)
[Configuration](#)

Home page → Configuration → Reports → RAP_PROD

Name	RAP_PROD	[modify]
Description		

Element(s) in RAP_PROD

Name

ELM00000

Description

file

Type

Dashboard

Name

PM 810 Aux

Format

Dashboard

[\[add an element\]](#)

[\[modify\]](#)

[\[modify\]](#)

[\[delete this element\]](#)

Alarms for the generation / transmission of RAP_PROD

Name

[AL_AB3_RIO_4AI@53](#) 

Description

Comm. failure AB3_RIO 4AI@53

[\[define an alarm\]](#)

[\[unlock this alarm\]](#)

This report can't be deleted because it is linked to other elements

Name	Report filename (at most 20 characters)										
Description	Description of the report file										
[add an item]	<table> <tr> <td>Name</td> <td>Name of the item added</td> </tr> <tr> <td>Description</td> <td>Description of the item added</td> </tr> <tr> <td>Type</td> <td>The item to be added may be of the dashboard type (to send instantaneous values) or the history type to send values saved and time tagged in files</td> </tr> <tr> <td>Format</td> <td> Define the report file format for this item. Tabulated text (FR) Tabulated text (EN) The sole difference between these 2 formats is the display of the date format. </td> </tr> <tr> <td>Duration</td> <td> <i>For history files only.</i> This field appears only in the report configuration page. It can be used to define the range of values to be inserted in the report. It is possible to send the complete file or the records made since a configurable time (in minutes, hours, days, weeks or months) </td> </tr> </table> <i>A report can contain several items: for example a dashboard and a measurement history. All the items of the report will be placed end to end in the same CSV Report file transmitted.</i>	Name	Name of the item added	Description	Description of the item added	Type	The item to be added may be of the dashboard type (to send instantaneous values) or the history type to send values saved and time tagged in files	Format	Define the report file format for this item. Tabulated text (FR) Tabulated text (EN) The sole difference between these 2 formats is the display of the date format.	Duration	<i>For history files only.</i> This field appears only in the report configuration page. It can be used to define the range of values to be inserted in the report. It is possible to send the complete file or the records made since a configurable time (in minutes, hours, days, weeks or months)
Name	Name of the item added										
Description	Description of the item added										
Type	The item to be added may be of the dashboard type (to send instantaneous values) or the history type to send values saved and time tagged in files										
Format	Define the report file format for this item. Tabulated text (FR) Tabulated text (EN) The sole difference between these 2 formats is the display of the date format.										
Duration	<i>For history files only.</i> This field appears only in the report configuration page. It can be used to define the range of values to be inserted in the report. It is possible to send the complete file or the records made since a configurable time (in minutes, hours, days, weeks or months)										
[define an alarm]	Switches over to the alarm configuration page in order to select the alarm whose occurrence will trigger transmission of the report. The report will therefore be able to be sent regularly (associating it with a cyclic alarm (once a day, for example) or else be event-triggered by associating it with a change of state or threshold crossing alarm										

The following sections summarize, through screen examples, the configuration of recipients and alarms.

Define the recipient(s) of the report

⚠ A report can be sent only to an FTP or email type recipient

The above recipient allows alarms to be sent to the FTP server ftperso.free.fr in the far-end directory \\xflow\reports\ using the ETH_TCP communication link. The name of the CSV files sent will be prefixed with the current Date and the Name of the site.

Define one or more alarms which will enable the report to be sent

A report is mandatorily linked to one or more alarms. In other words, a report must be attached to an alarm, so that the report will be sent to the recipient with its alarm. The sending of reports is therefore triggered regularly or upon the occurrence of events or alarms.

The alarm example above allows the RAP_PROD report to be sent regularly every day (= 1440 minutes) at 11.00 pm in accordance with the PROC_FTP call procedure.

Note on the name of the CSV file formed and sent to an FTP server or as an email attachment:

The report filename is formed and sent by XFlow as follows:

[DATE_] * [SITE_] * NAME_ALARM.XLS

* Optional prefix. In particular, these options make it possible to avoid overwriting files on a far-end server and allow a report file to be identified simply. These two options should be selected in the recipient configuration (cf. recipient screen above).

For example, in the above examples with the prefix by site name option in the FTP recipient, the report filename would be: H1234_RAP_FT_DAY.XLS

Configuration

User tasks/table of tasks

Xflow allows the development of applications whose execution it controls. In addition, it provides a programming interface so that applications may communicate with it.

For further information, please contact Schneider Electric Telecontrol.

Overview	74
Compatible Web browsers	74
Home page	74
Default dashboard or current alarms	74
Menus and functions accessible depending on the user's level	74
Home page when there are no alarms to be acknowledged	75
Home page when there are alarms to be acknowledged	75
Alarm acknowledgement	76
Consulting dashboards	76
Consulting synoptics	76
Consulting histories	77
Consulting measurement history files in table form	77
Consulting measurement history files in graph form	78
Consulting the connection file	78
Consulting the outgoing calls file	78
Consulting the alarm file	79
Consulting peripherals	79
Lifting station	79
Reservation	79

Overview

The routine operation of Xflow is generally limited to a few simple operations, upon the occurrence of an alarm or to meet a particular monitoring or adjustment need: acknowledgement of alarms, consulting history files for diagnosis, modification of a set point value, etc.

Compatible web browsers

Xflow uses the HTML standard, and thus ensures compatibility and sustainability with all Web browsers available commercially.

Xflow is capable of automatically recognizing a Pocket PC connection and issues appropriate pages providing access to the following functions and menus:

- Alarms: consulting and acknowledgement
- Dashboards: consulting and remote control orders
- History files: tables and curves.

Web browser	Accessible menus
Internet Explorer 5, 6 and 7	All
Firefox 3	All (on an Xflow release $\geq$ 2.0.0.1)
Google Chrome 3	All (on an Xflow release $\geq$ 2.0.0.2)
Opera 10	(on an Xflow release $\geq$ 2.0.0.2) (no synoptics)

Home page

Preliminary note: the ergonomics of the Web pages may change slightly from one release to another. This explains possible differences between the screen shots in the present document and the pages of your Xflow..

Default dashboard or current alarms

The home page displays either the dashboard that has been configured for default display, or the current alarms where applicable.

Menus and functions accessible depending on the user's level

The menus displayed in the menu bar vary depending on the user's level.

	Consultant	operator	Configurator	Administrator
Consulting dashboards and synoptics		■	■	■
Remote control orders in dashboards and synoptics		■	■	■
Consulting history files in table and graph form	■	■	■	■
Consulting lifting stations	■	■	■	■
Configuration of lifting stations			■	■
Consulting and configuration of reservations		■	■	■
Alarm acknowledgement		■	■	■
Configuration (except advanced configuration)			■	■
Advanced configuration				■

Home page when there are no alarms to be acknowledged

Not accessible to "Consultant" users

Not accessible to "Consultant" and "Operator" users

Click to refresh the dashboard and be able to execute remote control orders

Site : InterSolar
Home page
Dashboard Synoptics Histories Peripherals Configuration

English 06/05/10 16:03:48 | Logout

PTR Inverter Substation

Status	Variable	Description	Value
	PTR_16DIO_5	Temperature 1st threshold transformer (Alarm)	Normal
	PTR_16DIO_6	Temperature 2nd threshold transformer pressure (Activation)	Normal
	PTR_16DIO_9	RM6 earthing switch position	Opened
	PTR_16DIO_10	RM6 circuit-breaker position	Closed
	PTR_16DIO_11	RM6 activation on HTA fault	Normal

[show this dashboard]

Legend : Normal Locked In alarm On error

System synthesis

6 connection(s)	38 peripheral(s)	1023 variable(s)	2 recipient(s)	466 alarm(s)
1 On error	38 locked	12 locked	1 locked	

Enter the number of rows of data to display per page. 20 OK

Number of links set, in error or in modem failure

Number of peripherals set, in error or locked

Number of variables set, in reading error, locked or in active alarm

Number of alert recipients set, in error (blacklisted No.), in failure (No. invalidated 1 hour) or locked

Number of alarms set, enabled and locked

Home page when there are alarms to be acknowledged

Site : InterSolar
Home page
Dashboard Synoptics Histories Peripherals Configuration

English 06/05/10 16:26:23 | Logout

Date	Nom	Description	Nature	Valeur
09/10/09 12:16:48	High temperature	Temperature of the info room	Normal	23.00
09/10/09 15:24:53	Freezing	Outside temperature too low	Default	3.00
09/10/09 15:24:31	High temperature	Temperature of the info room	Default	27.00
07/10/09 10:08:00	AL_TempExt	Outside temperature	Normal	11.25
06/10/09 15:58:50	AL_TempExt	Outside temperature	Default	13.25
06/10/09 15:58:50	AL_TempExt	Outside temperature	Normal	11.25
06/10/09 15:57:20	AL_TempExt	Outside temperature	Default	26.00
06/10/09 15:54:45	AL_TempSalle	Room temperature	Normal	24.99

System synthesis

6 connection(s)	38 peripheral(s)	1023 variable(s)	2 recipient(s)	466 alarm(s)

The alarm to be acknowledged is indicated by a movable red exclamation mark. Click to acknowledge

Alarm acknowledgement

The alarms to be acknowledged appear on the home page.

Click on the exclamation mark to acknowledge

Date	Nom	Description	Nature	Valeur
12/10/09 12:16:48	High temperature	Temperature of the info room	Normal	23.00

After acknowledgement, Xflow displays the alarm history.

It is also possible to acknowledge all the alarms with a single click.

To do so, click on: **[see all alarms]**; the complete history of the alarms is displayed.

If alarms remain to be acknowledged, Xflow then offers the possibility of clicking on: **[acknowledge all alarms]**

Consulting dashboards

By clicking on "Dashboard" in the home page, it is possible to view all the configured dashboards.

The screenshot shows the Xflow Dashboard SIMIII interface. At the top, there's a header with the Schneider Electric logo, site name 'InterSolar', date '06/05/10 16:50:47', and a 'Logout' button. Below the header is a navigation bar with 'Dashboard', 'Synoptics', 'Histories', 'Peripherals', and 'Configuration'. The main content area shows a list of variables with columns for Status, Variable, Description, and Value. Annotations with dashed boxes point to various elements:

- Status:** A legend showing 'Locked' (lock icon), 'Alarm' (exclamation mark icon), and 'Variable in error' (X icon).
- List of all configured dashboards:** Points to the 'show this dashboard' dropdown menu.
- Automatic refreshment:** Points to the 'refresh every' dropdown menu.
- Current values of variables:** Points to the 'Value' column.
- Remote set point:** Points to the 'Yes' and 'No' buttons in the 'Value' column.

Consulting synoptics

The screenshot shows the Xflow Synoptic Syn RM6 RM6 synoptic interface. At the top, there's a header with the Schneider Electric logo, site name 'InterSolar', date '06/05/10 16:52:32', and a 'Logout' button. Below the header is a navigation bar with 'Dashboard', 'Synoptics', 'Histories', 'Peripherals', and 'Configuration'. The main content area shows a synoptic diagram of a RM6 unit. Annotations with dashed boxes point to various elements:

- Remote set point:** Points to the 'Remote set point: Modify the value and press Enter' text.
- Automatic refreshment:** Points to the 'refresh synoptic every' dropdown menu.
- List of consultable synoptics:** Points to the 'show the synoptic' dropdown menu.

Consulting histories

By clicking on "Histories" in the home page, it is possible to view all the history files in table form, to export them to a text file and also to view them in curve form for the measurement files.

Histories of alarms, events and connections

Name	Type	Nr rec.
ALARME	Alarm	136
APPSOR	Out calls	No recording
CONNEX	Connection	53

Histories of measures : tables and graphs
Check the variables to display as a graph till

Name	Variable	Operation	Nr rec.
* ENERGIE_H	☐ AB1_Ea_H ☐ AB2_Ea_H	Counter+init Counter+init	794 record(s). From 31/03/09 18:00:00 till 06/05/09 23:00:00

Measurement histories

Operation performed on the variable before saving

Histories of Alarms, Events, Connections and Outgoing calls

Consulting measurement history files in table form

Measurement history

Date/Heure	AB1_Ea_H (Counter+init)	AB2_Ea_H (Counter+init)	AB3_Ea_H (Counter+init)	AB4_Ea_H (Counter+init)	AB5_Ea_H (Counter+init)	AB6_Ea_H (Counter+init)	AB7_Ea_H (Counter+init)	AB8_Ea_H (Counter+init)	AB_E_PV_H
06/05/09 23:00:00	-0.00576	0.00272	-0.00846	-0.00987	-0.00483	-8.26026E-004	-0.00961	-0.00275	-0.0394
06/05/09 22:00:00	-0.0245	0.0253	-0.0488	-0.0530	-0.0238	-9.73858E-004	-0.0519	-0.0110	-0.189
06/05/09 21:00:00	0.920	1.43	0.708	0.653	0.986	1.21	0.756	1.07	7.73
06/05/09 20:00:00	7.67	8.33	7.49	7.38	7.81	8.05	7.62	7.83	62.18
06/05/09 19:00:00	31.98	32.81	31.95	31.62	32.72	32.95	32.52	32.30	258.85
06/05/09 18:00:00	62.19	63.09	62.35	61.66	63.67	63.72	63.28	62.54	502.51
06/05/09 17:00:00	87.50	88.40	87.94	86.80	89.50	89.52	88.90	87.82	706.39
06/05/09 16:00:00	105.13	105.95	105.69	104.21	107.38	107.41	106.65	105.36	847.79
06/05/09 15:00:00	115.20	115.71	115.79	114.05	117.56	117.64	116.70	115.11	927.78

Select the measurement files:

- ☐ One column per variable
- ☐ A single date-time per record for all the variables.

A button at the bottom of this page allows the data to be retrieved directly in a text file (this functionality is available for all the history files and not merely the measurement type files).

Export as text

From : Until : 06/05/10 16:58:48

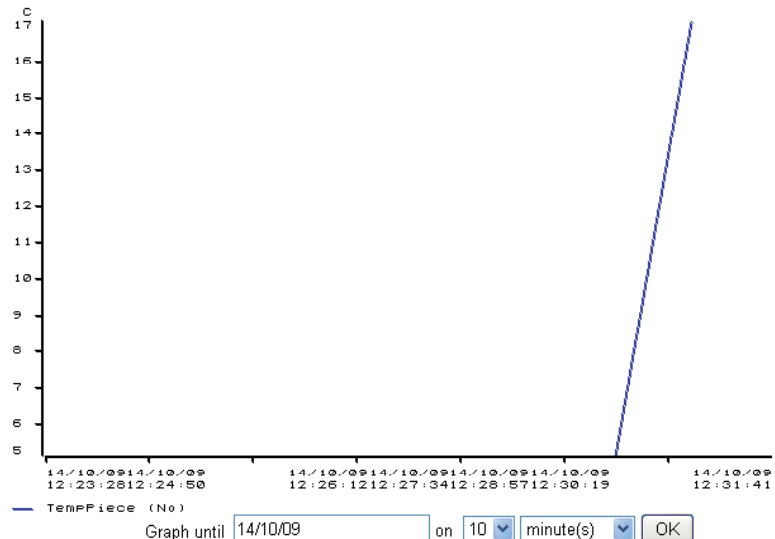
number of records , with columns header ☐

Consulting measurement history files in graph form

- Select the paths to be plotted
- Select a period
- Click on the OK button
- Display of the multi-curve graph:
 - ☐ one curve per variable (automatic choice of colour)
 - ☐ adjustable period
 - ☐ automatic calculation of axes:
 - as many axes as different units
 - minimum and maximum of axes calculated automatically according to the extreme values for the selected period.

💡 It is possible to display variables saved in different measurement files.

💡 With Internet Explorer, a  icon appears prompting the user to view the graph in Adobe SVG format.



Consulting the connection file

Click on the name of the connection file.

Date of connection

User name

Origin of connection

Date	User	Address	Protocol	Type
06/05/10 16:44:37	TEST	127.0.0.1	HTTP	Login
06/05/10 16:01:56	TEST	127.0.0.1	HTTP	Login
06/05/10 15:27:34	TEST	127.0.0.1	HTTP	Login
06/05/10 14:45:27	TEST	127.0.0.1	HTTP	Login
06/05/10 14:45:16	TEST	127.0.0.1	HTTP	Logout
06/05/10 14:44:01	TEST	127.0.0.1	HTTP	Login
06/05/10 08:24:00	TEST	127.0.0.1	HTTP	Login
05/05/10 08:10:09	TEST	127.0.0.1	HTTP	Timeout
04/05/10 23:49:04	TEST	127.0.0.1	HTTP	Login
06/04/10 14:02:32	TEST	127.0.0.1	HTTP	Login
16/02/10 10:54:49	SCHNEIDER	127.0.0.1	HTTP	Login
16/02/10 10:19:41	SCHNEIDER	127.0.0.1	HTTP	Login
03/12/09 17:24:02	SCHNEIDER	10.196.42.32	HTTP	Login
08/10/09 14:58:28	SCHNEIDER	127.0.0.1	HTTP	Logout

Communication protocol:

- Napbus: Kerwin or Kervisu
- HTTP: Kerwin or Web browser

Connection type:

- Login: entry into the system
- Logout: exit from the system
- Timeout: automatic exit upon exceeding the maximum authorized time

Consulting the outgoing calls file

Name of recipient

Link type

Type of alert medium

Date	Recipient	Connection Type	Duration	Result	Code étendu
14/10/09 12:22:52	Mail	TCP_IP	Mail	1	TCP Conn. refused
14/10/09 12:22:50	Kerwin_WxFR88084L	TCP_IP	Kerwin	1	TCP Conn. refused
14/10/09 12:20:56	Mail	TCP_IP	Mail	1	TCP Conn. refused
14/10/09 12:20:49	Kerwin_WxFR88084L	TCP_IP	Kerwin	1	TCP Conn. refused
14/10/09 12:18:54	Mail	TCP_IP	Mail	0	TCP Conn. refused

English

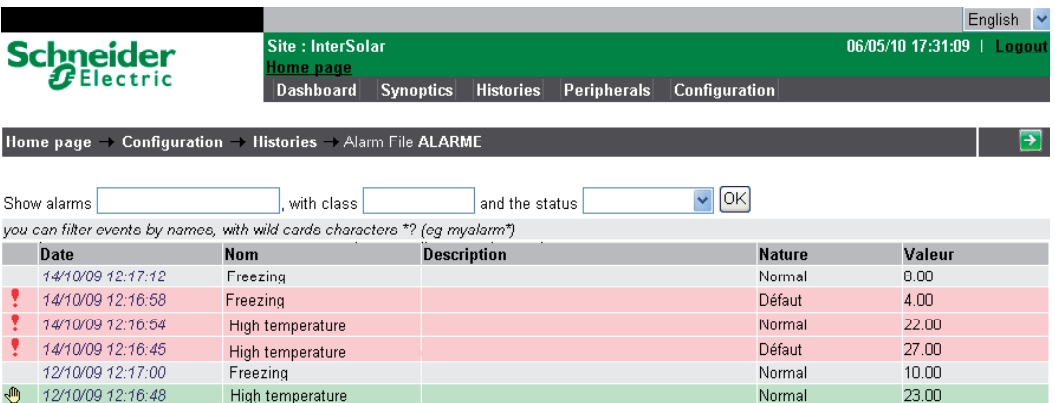
Consulting the alarm file

Alarm status

“Nothing” Indication (no outbound call)

 Alarm acknowledged

 Alarm not acknowledged



Date	Nom	Description	Nature	Valeur
14/10/09 12:17:12	Freezing		Normal	0.00
14/10/09 12:16:58	Freezing		Défaut	4.00
14/10/09 12:16:54	High temperature		Normal	22.00
14/10/09 12:16:45	High temperature		Défaut	27.00
12/10/09 12:17:00	Freezing		Normal	10.00
12/10/09 12:16:48	High temperature		Normal	23.00

⚠ It is possible to acknowledge an alarm manually by clicking on the  icon relating to the alarm to be acknowledged.

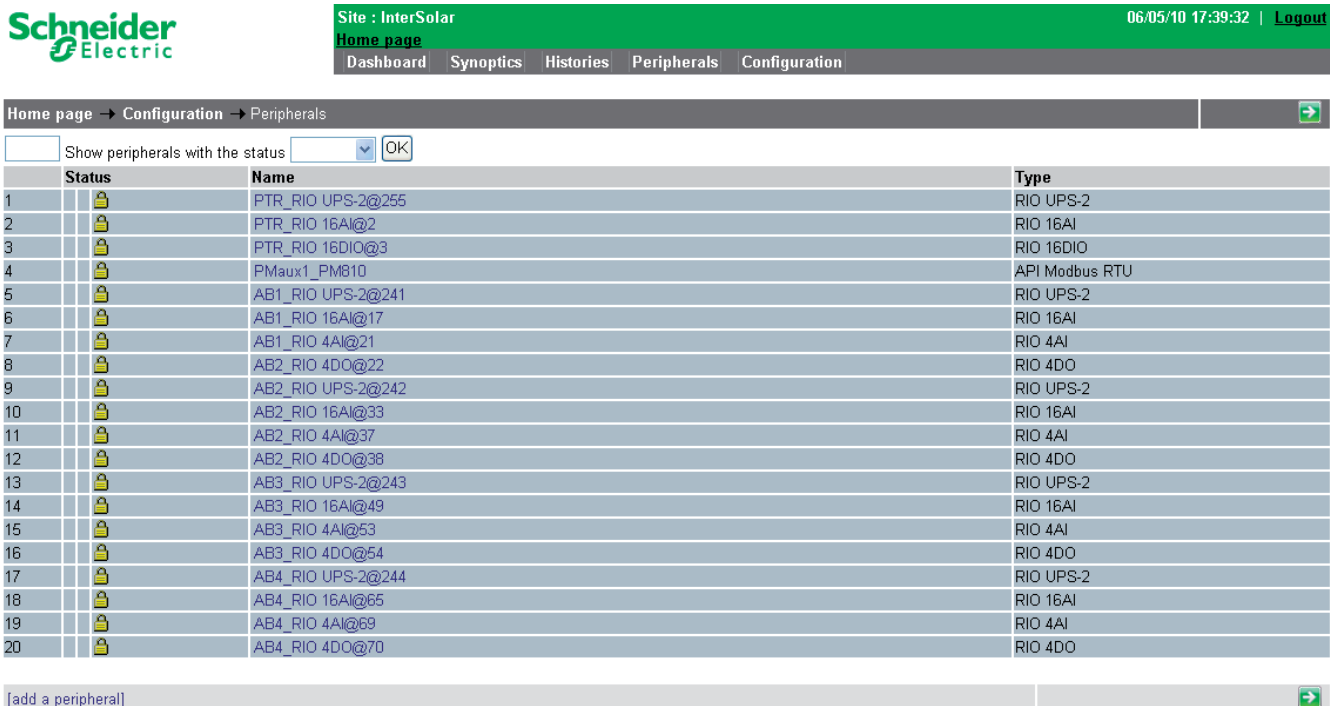
You can also filter alarms by status, by variable or by alarm.

It is also possible to obtain the details of an alarm by clicking on its date.

Consulting peripherals

It is possible to view all the variables of a peripheral self-described directly (without configuring the variables in the device) by clicking on “Peripherals” on the home page. Simply choose the peripheral to be viewed.

To be able to be in the list, the peripheral must be self-described and configured in the device. Click on the peripheral of your choice and let yourself be guided.



Status	Name	Type
1	PTR_RIO UPS-2@255	RIO UPS-2
2	PTR_RIO 16AI@2	RIO 16AI
3	PTR_RIO 16DIO@3	RIO 16DIO
4	PMaux1_PMB10	API Modbus RTU
5	AB1_RIO UPS-2@241	RIO UPS-2
6	AB1_RIO 16AI@17	RIO 16AI
7	AB1_RIO 4AI@21	RIO 4AI
8	AB2_RIO 4DO@22	RIO 4DO
9	AB2_RIO UPS-2@242	RIO UPS-2
10	AB2_RIO 16AI@33	RIO 16AI
11	AB2_RIO 4AI@37	RIO 4AI
12	AB2_RIO 4DO@38	RIO 4DO
13	AB3_RIO UPS-2@243	RIO UPS-2
14	AB3_RIO 16AI@49	RIO 16AI
15	AB3_RIO 4AI@53	RIO 4AI
16	AB3_RIO 4DO@54	RIO 4DO
17	AB4_RIO UPS-2@244	RIO UPS-2
18	AB4_RIO 16AI@65	RIO 16AI
19	AB4_RIO 4AI@69	RIO 4AI
20	AB4_RIO 4DO@70	RIO 4DO

[add a peripheral]

Overview	82
Modbus	84
RIO cards	86
Pallas	87
Calec	87
Ciclade D10, Ciclade combined	88
ERW 521	88
IAC600	89
Satnet	90
Liberty red	91
TSX series 7	92
Gamesa C30/G52	93
Trend – IQ controller	94
OPC client	96
SunEzy	96
Xantrex	97
Yokogawa	97

Xflow is capable of communicating via an electronic link with various acquisition devices: Schneider Electric products (RIO cards, Power meter, protection equipment, etc.) and third-party products (PLCs, controllers, digital counters, etc.).

These various types of peripheral are covered by description files (XML file in the rad directory) which contain:

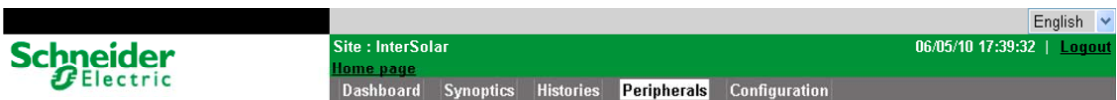
- the name of the peripheral
- the default settings (speed, format, timeout, etc.)
- the available channels (for certain peripherals).

A channel is pre-described peripheral variable, which avoids the user having to enter an address.

Some peripherals require the use of a communication gateway capable of converting the physical interfaces managed by Xflow (RS232 and RS485 as standard).

The default parameters specified for the devices can be modified depending on conditions of use of the equipment.

Direct access: for some peripherals, Xflow proposes direct access pages allowing the user to view the current state of all the peripheral's channels, without setting any variable in Xflow (e.g. counters, controllers).



Legends for this chapter

Black bullet (■): preferred choices

White bullet (□): other options

Bold text (after a bullet): default configuration

Text in normal (after a bullet): not configured by default.

Examples:

■ 232: preferred choice but not configured by default

□ 485: configured by default but not recommended

Note: there may be several choices for the same configuration.

The table below summarizes the devices compatible with Xflow.

Brand	Model	Protocol	Direct access	Interface
Schneider Electric Telecontrol	RIO (All Measurement cards)	Modbus	YES (for the 4AI, 16AI and 8AIS cards, only traceability is accessible)	RS485
Schneider Electric	Power meter P9C, PM7xx, PM8xx, PM500	Modbus	NO	RS485
Schneider Electric	Sepam Protection	Modbus	NO	RS485
Sunezy inverter (Schneider Electric)	400E, 600E, 2000, 2800 and 4000	SunEzy	YES	RS485
Xantrex inverters (Schneider Electric)	GT 100E, GT 250E and GT 500E	CCU2	YES	RS485/Ethernet
Xantrex inverters (Schneider Electric)	GT 30		YES	RS485
Schneider Electric (Telemecanique)	Ositrack : rfid tag reader (XGCS4901201)	Modbus	NO	RS485
Schneider Electric and others	Twido, M340, ...	Modbus TCP ⁽³⁾	NO	Ethernet
Schneider Electric and others	All (PLC Modbus Modbus)	Modbus	NO	RS232/RS485
	All (PLC Modbus ASCII peripheral)	Modbus ASCII	NO	RS232/RS485
Schneider Electric (TAC/Satchwell)	Liberty IAC421, ..., 424	Satnet	YES	RS485
Schneider Electric (TAC/Satchwell)	Satnet PLC peripheral	Satnet	NO	RS485
Schneider Electric (TAC/Satchwell)	Liberty Red	Esp	YES	RS485
Schneider Electric (TAC/Satchwell)	ESP PLC peripheral	Esp	NO	RS485
Schneider Electric (Telemecanique)	TSX series 7	Unitelway	NO	RS485
Itron (Actaris)	Ciclade D10, Ciclade D10 combined, CF50, CF100, cyble	Mbus	YES	Via RS232/Mbus gateway (PW3) ⁽¹⁾
Itron (Actaris)	CF-51, CF-55, CF-800, CF-ECHO II	Mbus	NO	Via RS232/Mbus gateway (PW3) ⁽¹⁾
Danfoss	ERW 521	Mbus	YES	Via RS232/Mbus gateway (PW3) ⁽¹⁾
Sappel	Calec, Pallas	Mbus	YES	Via RS232/Mbus gateway (PW3) ⁽¹⁾
Sappel	Pallas RS	Mbus	YES	RS485
	Any Mbus device (Mbus PLC peripheral)	Mbus	NO	Via RS232/Mbus gateway (PW3) ⁽¹⁾
Trend	IQ7x, IQ9x, IQ10x, IQ111, IQ131, IQ150, IQ151, IQ2xx	Trend	YES (for timetables only) NB: slow access	RS232 via CNC ⁽²⁾
Yokogawa	FA-M3 series	Personal Computer Link Command	YES (for system data)	RS232 (via Yokogawa F3LC11-1N module)/ RS485 (via Yokogawa F3LC11-2N module)
Xflow OPC Client; allows polling of OPC servers ⁽⁴⁾		Data Access 2.0 under DCOM	NO	Only on PC (impossible on iRIO)

(1) There is also the PW60 which can feed up to 60 counters and which allows Xflow to be connected either in RS232 or in 485 mode.

(2) Whenever an Xflow peripheral of this type is defined, the port becomes dedicated to this type of communication (impossible to communicate with another type of peripheral on the same port).

(3) On an Ethernet network: Xflow can poll slaves in MODBUS_TCP (remote acquisition modules or Modbus_TCP slave PLCs).

(4) The OPC servers are often compatible with a wide range of third-party devices (PLCs, controllers, etc.). They can be used to serve communication gateways between Xflow and a third-party device whose communication driver is not supported directly by Xflow.
Xflow cannot be an OPC server. This means that it does not provide OPC clients with its data (the values of its variables, for example).

Modbus

This type of peripheral can be used to poll any type of slave PLC dialoguing in MODBUS mode. Xflow is Master.

The Modbus TCP protocol is available on hardware platforms having an Ethernet interface (iRIO, industrial PC). It is automatically selected whenever the link chosen for the PLC is of TCP type. For Modbus ASCII, a serial type link should be selected.

Driver names	API Modbus, API Modbus-TCP, API Modbus ASCII
Manufacturer	/
Model	Any Modbus-compatible peripheral
Protocol	Modbus
Direct access	☒ No, ☐ Yes

Link					
☒ Serial	☒ 232	☒ 485	☐ Open loop	☐ Current loop	☐
	Bits	☒ 8	☐ 7		
	Parity	☐ Even	☐ Odd	☐ No parity	
	Stop	☐ 0	☐ 1	☐ 2	
	Speed				

☐ Modem		
☒ Ethernet	☒ TCP (port 502)	☐ UDP (port

Peripheral

Type	Modbus
Address	Modbus address of the device with which dialogue is wanted. Numerical data to be entered in hexadecimal (e.g. \$01) or in decimal code (e.g. 01). The addresses go from 0 to 255.

IP Address	Information necessary for dialogue with a Modbus PLC in TCP, on an Ethernet LAN. The format is address_ip :port where port is equal to 502 (which is the IP port number reserved for the Modbus TCP protocol), for example 172.16.10.13:502. This information is accessible only when the link is of TCP type.
-------------------	--

Gateway	☒ No, ☐ Yes
Failure time delay (in ms)	500
Max. number of failures (in ms)	0
End-of-frame delay (in ms)	15
Grouping length (in bytes)	64
Grouping space (in bytes)	16

Variables

Channels	☒ No, ☐ Yes
-----------------	--

Address	The address is a numerical data item entered in hexadecimal code (e.g. \$1200) or in decimal code (e.g. 4608). It is possible to set the function codes in Modbus read and/or write modes in the address as follows: @[read code],[write code]: [address of the variable].
----------------	--

Possible Modbus codes

Data type	Read code	Write code
Bit or boolean	1 (by default) or 2	15 (by default) or 5
Word	3 (by default) or 4	16 (by default) or 6
Double word	3 (by default) or 4	16
Floating point	3 (by default) or 4	16

Example: variable at decimal address 25, with use of read code 3 and write code 16
@3,16:25 or @3,16:\$19 or @3,16:19H

▲ If no function code is specified, Xflow takes the codes 1 and 15 for the Boolean variables (logical, digital) and codes 3 and 16 for all other formats.

Specific case of Teleflo (dedicated Air Liquide RTUs)

It is possible to specify the table in which you want to work as follows:
[table code]:[address of the variable].

The codes are as follows:

Table code	Description of tables	Read code	Write code
0	Digital inputs	1	5
1	Digital outputs	2	5
3	Analogue inputs	4	16
4	ANA inputs/outputs	3	16

Example: variable in the ANA inputs/outputs table, at address 18 (decimal)
18 or \$12 or 12H or 4:12H or 4:18

▲ If no table is specified, Xflow takes the codes of table 1, the Boolean variables and the codes of table 4 for all other formats.

Reading format

The Modbus PLC data types and their coding require choosing the appropriate reading format. The various formats known by Xflow are as follows:

Name	Description	Taille
Bit	Elementary entity (0 or 1)	1 bit
Word	Value between 0 and 65535. The order of the bytes is as follows: b0..b7 b8..b15	2 bytes
Inverted word	Value between 0 and 65535. The order of the bytes is as follows: b8..b15 b0..b7	2 bytes
Signed word	Value between -32768 and 32767. The order of the bytes is as follows: b0..b7 b8..b15	2 bytes
Inverted signed word	Value between -32768 and 32767. The order of the bytes is as follows: b8..b15 b0..b7	2 bytes
Signed double word	Value between -2147483648 and 2147483647. The order of the bytes is as follows: b0..b7 b8..b15 b16..b23 b24..b31	4 bytes
Double word	Value between 0 and 4294967295. The order of the bytes is as follows: b0..b7 b8..b15 b16..b23 b24..b31	4 bytes
Inverted double word	Value between 0 and 4294967295. The order of the bytes is as follows: b24..b31 b16..b23 b8..b15 b0..b7	4 bytes
Swapped double word	Value between 0 and 4294967295. The order of the bytes is as follows: b16..b23 b24..b31 b0..b7 b8..b15	4 bytes
Swapped inverted double word	Value between 0 and 4294967295. The order of the bytes is as follows: b8..b15 b0..b7 b24..b31 b16..b23	4 bytes
Decimal (IEEE)	Floating point between 1.5×10^{-45} and 3.4×10^{38} . The order of the bytes is as follows: b0..b7 b8..b15 b16..b23 b24..b31	4 bytes
Inverted decimal (IEEE)	Floating point between 1.5×10^{-45} and 3.4×10^{38} . The order of the bytes is as follows: b24..b31 b16..b23 b8..b15 b0..b7	4 bytes
Swapped decimal (IEEE)	Floating point between 1.5×10^{-45} and 3.4×10^{38} . The order of the bytes is as follows: b16..b23 b24..b31 b0..b7 b8..b15	4 bytes
Swapped decimal word (IEEE)	Floating point between 1.5×10^{-45} and 3.4×10^{38} . The order of the bytes is as follows: b8..b15 b0..b7 b24..b31 b16..b23	4 bytes

Class	■ No, □ Yes
Grouping of variables	□ No, ■ Yes
Comments	The grouping of variables is performed according to the read codes and the variable addresses.

RIO cards

This type of peripheral allows dialogue with RIO acquisition cards (of the iRIO range). Each card is a Modbus slave of Xflow.

For more information concerning the characteristics of each of the RIO cards, refer to their individual technical manuals.

Driver name	RIO UPS-2, RIO 8AIS, RIO 4DO-S, RIO 4DO, RIO 4DI, RIO 4AIO-V, RIO 4AIO-C, RIO 4AI-C, RIO 4AI, RIO 2AI-V3, RIO 2AI-V2, RIO 2AI-V1, RIO 2 COM, RIO 16DIO, RIO 16DI, RIO 16AI, RIO 14ADIO			
Manufacturer	Schneider Electric Telecontrol			
Model	All RIO input/output cards			
Protocol	Modbus			
Direct access	The Web interface of Xflow proposes pages for direct access to this type of peripheral			
Link				
■ Serial	☐ 232	■ 485	☐ Open loop	☐ Current loop
	Bits	■ 8	☐ 7	
	Parity	■ Even	☐ Odd	☐ No parity
	Stop	☐ 0	■ 1	☐ 2
	Speed	115200 or (9600 if the cards are inserted in remote extensions)		

Peripheral

The RIO peripherals can be created automatically using the advanced function to search for peripherals on the link (on the iRIO platform, the RIO cards are connected to the R1-485 network (COM3)).

Type	RIO2 UPS-2, RIO2 8AIS, RIO1 4DO-S, RIO1 4DO, RIO 4DI, RIO 4AIO-V, RIO 4AIO-C, RIO 4AI-C, RIO 4AI, RIO 2AI-V3, RIO 2AI-V2, RIO 2AI-V1, RIO2 COM, RIO 16DIO, RIO 16DI, RIO 16AI, RIO 14ADIO
Address	Card slave No. Numerical data to be entered in hexadecimal (e.g. \$01) or in decimal code (e.g. 01). The addresses go from 0 to 255. The number depends on the position of the thumbwheel (or switches) in the enclosure containing the card, the card's position in the enclosure and the number of the UPS 1 power supply (or the CPU card).
Failure time delay (in ms)	500
Max. number of failures (in ms)	0
End-of-frame delay (in ms)	15
Grouping length (in bytes)	8
Grouping space (in bytes)	4

Variables

Xflow proposes the list of variables available on this peripheral type, the **address** and **reading format** fields do not have to be filled in by the user

Pallas

This type of peripheral can be used to poll the Pallas power meters of the company Sappel

Driver name	Pallas
Manufacturer	Sappel
Model	Pallas, Pallas RS
Protocol	M-Bus
Direct access	The Web interface of Xflow proposes pages for direct access to this type of peripheral

Link

An M-Bus / RS232-485 gateway must be used to connect an Xflow to this type of peripheral.

The configuration of the link depends on the gateway.

It is also possible to connect to the RS232 port (Rx 57, Tx 56, gnd) or the RS485 port (R+ 56, R- 57) of Pallas, if it has one.

Peripheral

Type	Pallas
Address	<i>address_MBUS</i> (addressing by serial number impossible) The MBUS address is a numerical value from 0 to 255
Failure time delay (in ms)	2000
Max. number of failures (in ms)	0
End-of-frame delay (in ms)	60
Grouping length (in bytes)	Not used
Grouping space (in bytes)	Not used

Variables

Xflow proposes the list of variables available on this peripheral type, the **address** and **reading format** fields do not have to be filled in by the user. Xflow manages the optimized reading of variables on this peripheral. By nature, all the variables are read in a single frame.

Comments

It is possible that some channels given in the list may be in error at the time of their configuration, because they are not available in the frame. The list of channels is established based on manufacturer documents, but some devices are not initialized to give this information.

Calec

This type of peripheral can be used to poll the Calec power meters of the company Sappel

Driver name	Calec
Manufacturer	Sappel
Model	Calec MB
Protocol	M-Bus
Direct access	The Web interface of Xflow proposes pages for direct access to this type of peripheral

Link

An M-Bus/RS232-485 gateway must be used to connect an Xflow to this type of peripheral.

The configuration of the link depends on the gateway.

It is also possible to connect to the RS 232 or RS 485 port of Calec, if it has one.

Peripheral

Type	Calec MB
Address	<i>address_MBUS</i> (addressing by serial number impossible) The MBUS address is a numerical value from 0 to 255
Failure time delay (in ms)	2000
Max. number of failures (in ms)	0
End-of-frame delay (in ms)	60
Grouping length (in bytes)	Not used
Grouping space (in bytes)	Not used

Variables

Xflow proposes the list of variables available on this peripheral type, the address and reading format fields do not have to be filled in by the user. Xflow manages the optimized reading of variables on this peripheral. By nature, all the variables are read in a single frame.

Comments

It is possible that some channels given in the list may be in error at the time of their configuration, because they are not available in the frame. The list of channels is established based on manufacturer documents, but some devices are not initialized to give this information.

Specific peripherals

Ciclade D10, Ciclade combined

ERW 521

Ciclade D10, Ciclade combined

This type of peripheral can be used to poll the Ciclade D10 power meters of the company Schlumberger

Driver name	Ciclade D10, Ciclade combined
Manufacturer	Schlumberger
Model	Ciclade
Protocol	M-Bus
Direct access	The Web interface of Xflow proposes pages for direct access to this type of peripheral

Link

An M-Bus/RS232-485 gateway must be used to connect an Xflow to this type of peripheral.
The configuration of the link depends on the gateway.

Peripheral

Type	Ciclade D10, Ciclade combined
Address	<i>address_MBUS</i> . The MBUS address is a numerical value from 0 to 255 Or else <i>Serial number</i> .

The number must be entered as it is read on the device, preceded by a \$. Sometimes it must be entered in reverse, depending on the manufacturer/devices.

Example: if you read the number 11223344 then you must enter \$11223344 or else \$44332211 (one chance out of two)
Sometimes the number takes the form 01-223344, in which case the 01 must be inverted at data entry, which will give \$10223344 (or else \$44332210)

Failure time delay (in ms)	1000
Max. number of failures (in ms)	0
End-of-frame delay (in ms)	60
Grouping length (in bytes)	Not used
Grouping space (in bytes)	Not used

Variables

Xflow proposes the list of variables available on this peripheral type, the **address** and **reading format** fields do not have to be filled in by the user.
Xflow manages the optimized reading of variables on this peripheral. By nature, all the variables are read in a single frame.

Comments

It is possible that some channels given in the list may be in error at the time of their configuration, because they are not available in the frame.
The list of channels is established based on manufacturer documents, but some devices are not initialized to give this information.

ERW 521

This type of peripheral can be used to poll the ERW 521 power meters of the company Danfoss

Driver name	ERW 521
Manufacturer	Danfoss
Model	ERW 521
Protocol	M-Bus
Direct access	The Web interface of Xflow proposes pages for direct access to this type of peripheral

Link

An M-Bus/RS232-485 gateway must be used to connect an Xflow to this type of peripheral. The configuration of the link depends on the gateway.
If the Danfoss controller is provided with an RS232 or RS485 link, it is possible to connect to it without a gateway.

Peripheral

Type	ERW 521
Address	<i>address_MBUS</i> . The MBUS address is a numerical value from 0 to 255 Or else <i>Serial number</i> .

The number must be entered as it is read on the device, preceded by a \$. Sometimes it must be entered in reverse, depending on the manufacturer/devices.

Example: if you read the number 11223344 then you must enter \$11223344 or else \$44332211 (one chance out of two).
Sometimes the number takes the form 01-223344, in which case the 01 must be inverted at data entry, which will give \$10223344 (or else \$44332210).

Failure time delay (in ms)	800
Max. number of failures (in ms)	0
End-of-frame delay (in ms)	60
Grouping length (in bytes)	Not used
Grouping space (in bytes)	Not used

Variables

Xflow proposes the list of variables available on this peripheral type, the **address** and **reading format** fields do not have to be filled in by the user.
Xflow manages the optimized reading of variables on this peripheral. By nature, all the variables are read in a single frame.

Comments

It is possible that some channels given in the list may be in error at the time of their configuration, because they are not available in the frame.
The list of channels is established based on manufacturer documents, but some devices are not initialized to give this information.

IAC600

This type of peripheral can be used to poll the IAC600 controllers of the company TAC

Driver name	IAC 600
Manufacturer	TAC
Model	IAC 600
Protocol	Satnet
Direct access	The Web interface of Xflow proposes pages for direct access to this type of peripheral

Link				
■ Serial	☐ 232	■ 485	☐ Open loop	☐ Current loop
	Bits	☐ 8	■ 7	
	Parity	■ Even	☐ Odd	☐ No parity
	Stop	☐ 0	■ 1	☐ 2
	Speed	1200 (by default) or 4800		

Peripheral	
Type	IAC 600 (Satchwell)
Address	<i>address_screen:address_controller</i> If the controller does not have a screen gateway <i>address_screen = 0</i> Example: ■ For a controller of address 2 connected to an Xflow via a screen gateway of address 4, the address will be 4:2 ■ For a controller of address 3 connected directly to an Xflow without a screen gateway, the address will be 0:3

The following data are provided for information

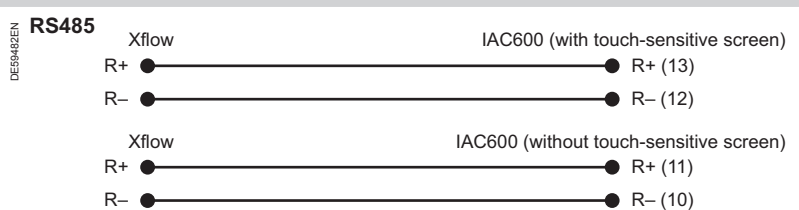
Failure time delay (in ms)	1500
Max. number of failures (in ms)	1
End-of-frame delay (in ms)	80
Grouping length (in bytes)	64
Grouping space (in bytes)	16

Variables

Xflow proposes the list of variables available on this peripheral type, the **address** and **reading format** fields do not have to be filled in by the user. Xflow manages the optimized reading of variables on this peripheral.

Connection

The IAC600 controllers have only an RS485 interface.
The connection is different if the controller has a touch-sensitive screen.



Satnet

The Satnet driver allows polling of any device implementing the Satnet protocol.

Driver name	Satnet
Manufacturer	TAC/Satchwell
Model	All devices compatible with the Satnet protocol
Protocol	Satnet
Direct access	The Web interface of Xflow proposes pages for direct access to this type of peripheral

Link

Serial	☐ 232	485	☐ Open loop	☐ Current loop
Bits	☐ 8	7		
Parity	Even	☐ Odd	☐ No parity	
Stop	☐ 0	1	☐ 2	
Speed	1200			

Peripheral

Type	API Satnet
Address	<i>address_screen:address_controller</i> If the controller does not have a screen gateway <i>address_screen = 0</i> Example: ■ For a controller of address 2 connected to an Xflow via a screen gateway of address 4, the address will be 4:2 ■ For a controller of address 3 connected directly to an Xflow without a screen gateway, the address will be 0:3

The following data are provided for information

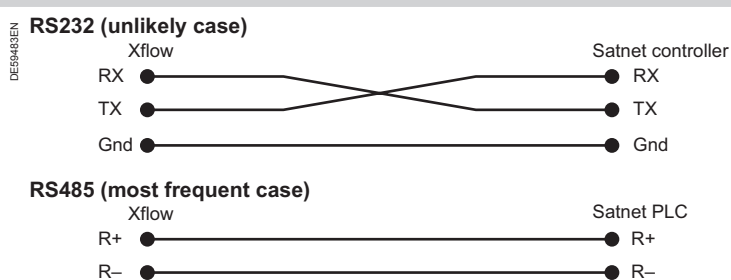
Failure time delay (in ms)	1500
Max. number of failures (in ms)	1
End-of-frame delay (in ms)	80
Grouping length (in bytes)	64
Grouping space (in bytes)	16

Variables

Xflow proposes the list of variables available on this peripheral type, the **address** and **reading format** fields do not have to be filled in by the user. Xflow manages the optimized reading of variables on this peripheral

Connection

Connection depends on your hardware platform and the communication port that you use for polling your peripheral. There are generally 2 types of connection:



Liberty red

This type of peripheral allows dialogue with a Liberty Red controller from Satchwell (TAC).

Driver name	Liberty red			
Manufacturer	TAC/Satchwell			
Model	Liberty red			
Protocol	ESP			
Direct access	The Web interface of Xflow proposes pages for direct access to this type of peripheral			
Link				
■ Serial	☐ 232	■ 485	☐ Open loop	☐ Current loop
	Bits	■ 8	☐ 7	
	Parity	☐ Even	☐ Odd	■ No parity
	Stop	☐ 0	■ 1	☐ 2
	Speed	9600		

Peripheral

Type	Liberty red (Satchwell)
Address	<i>address_screen:address_controller</i> If the controller does not have a screen gateway, <i>address_screen = 0</i> Example: ■ For a controller of address 2 connected to an Xflow via a screen gateway of address 4, the address will be 4:2 ■ For a controller of address 3 connected directly to an Xflow without a screen gateway, the address will be 0:3

The following data are provided for information

Failure time delay (in ms)	2000
Max. number of failures (in ms)	1
End-of-frame delay (in ms)	100
Grouping length (in bytes)	64
Grouping space (in bytes)	16

Variables

Xflow proposes the list of variables available on this peripheral type, the **address** and **reading format** fields do not have to be filled in by the user. Xflow manages the optimized reading of variables on this peripheral.

TSX series 7

Driver name		Unitelway			
Manufacturer		Schneider Telemecanique			
Model		TSX Micro			
Protocol		UNI-Telway			
Direct access		☒ No, ☐ Yes			
Link					
☒ Serial	☐ 232	☒ 485	☐ Open loop		☐ Current loop
	Bits	☒ 8	☐ 7		☐
	Parity	☒ Even	☐ Odd	☐ No parity	
	Stop	☐ 0	☒ 1	☐ 2	
	Speed				
☐ Modem					
☐ Ethernet	☐ TCP (port		☐ UDP (port		
Comments		Speeds 1200/2400/4800/9600. Xflow as Unitelway slave only			

Peripheral	
Type	API Unitelway
Address	To be entered in the form: XX:NN:SS:GG:MM:CC XX => Xflow channel number on the bus NN => Network field SS => Station field GG => Port field MM => Module field CC => Channel field.

When the PLC to be polled is the Master, the address must be entered as follows: XX:NN:\$FE:SS:GG:CC. (or else XX:NN:254:SS:GG:CC)

If you do not know what to enter, the safest thing is to enter the following value: **XX:00:\$FE:00:00:00** (or else **XX:00:254:00:00:00**)
It is the \$FE value (254) that identifies the master.

When the PLC to be polled is another slave on the bus, its address must be entered as follows: **XX:00:00:00:00:CC**

In both cases, XX represents the Xflow channel number on the bus.

Where Xflow is connected to the terminal connector (TER) of the master PLC, not only must the value XX not be greater than 8, but it must also be ensured that the master PLC is configured to recognize a number of slaves on its terminal connector at least equal to XX. It should also be ensured that the XX address is not already used by another device.

Gateway	☒ No, ☐ Yes
Failure time delay (in ms)	UNUSED *
Max. number of failures (in ms)	UNUSED *
End-of-frame delay (in ms)	-1 *
Grouping length (in bytes)	57
Grouping space (in bytes)	56

Comments (*) These fields are managed by the driver, and cannot be modified. The values given here are indicative, and those marked UNUSED have no influence on the driver.

Variables	
Channels	☒ No, ☐ Yes

Address, 2 possible syntaxes:

1- Comply with a syntax similar to the Telemecanique syntax used in the PL7 software environment, with **IN ADDITION the two dots between %X and the address**

Internal bits: enter **%M:number**

System bits: enter **%S:number**

Internal words: enter **%MW:number**

System words: enter **%SM:number** or else **%SW:number**

Internal double words: enter **%MD:number** or else **%MDW:number**

Constant words: enter **%KW:number** **READ-ONLY !!**

Constant double words: enter **%KD:number** or else **%KDW:number** **READ-ONLY !!**

"number" represents the number of the variable, in decimal or hexadecimal code.

For example, to read the internal word 125, its address must be entered as follows: **%MW:125**

2- Enter only the number in the address field, then choose the format from those proposed in the "reading format" list

Class	☒ No, ☐ Yes
Grouping of variables	☐ No, ☒ Yes

Comments	
1-	Xflow is positioned exclusively as slave on the Unitelway bus: accordingly, Xflow does not have the initiative for communication and can poll the PLCs only when the Master enables it to dialogue.
2-	It is strongly recommended to use only Schneider Electric/Telemecanique equipment for cabling and to comply with the cabling recommendations described in the Schneider Electric Telemecanique documentation (in particular concerning the earthing of devices).

Gamesa C30/G52

This type of peripheral allows dialogue with a Gamesa PLC performing management of a Gamesa Eolica wind turbine.

Gamesa contacts:

Gamesa Eolica

Poligono de Augustinos, Calle A S/N

31013 Pamplona, Spain

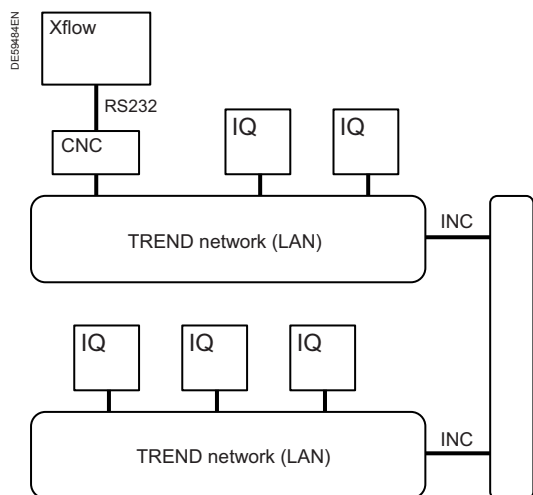
34 948 309010

34 948 309009 (fax)

ingeniera@eolica.gamesa.es

Driver name	Gamesa				
Manufacturer	Gamesa Eolica				
Model	C30 and G52				
Protocol	C30				
Direct access	No pages in direct access				
Link					
☒ Serial	☒ 232	☐ 485	☐ Open loop	☐ Current loop	☐
	Bits	☒ 8	☐ 7		
	Parity	☒ Even	☐ Odd	☐ No parity	
	Stop	☐ 0	☒ 1	☐ 2	
	Speed	9600			
☐ Modem					
☐ Ethernet	☐ TCP (port)		☐ UDP (port)		
Peripheral					
Type	Gamesa wind turbine				
Address	Address of the PLC equipping the wind turbine Example \$12 for wind turbine 18 NB: the protocol provides for an address of the master, which is set to 0 in the frames exchanged.				
Gateway	☒ No, ☐ Yes				
Failure time delay (in ms)	500				
Max. number of failures (in ms)	3				
End-of-frame delay (in ms)	100				
Grouping length (in bytes)	0				
Grouping space (in bytes)	0				
Variables					
Channels	☐ No, ☒ Yes				
Address	\$PPXX, where PP : number of the initial word in the frame (depends on the application: a document specifying the map of the application must be supplied for each installation); the words are numbered from 1 (and not 0). XX : details of the information format (FF PPPPPP) : FF : format (00: for a bit, 01 for a word, 10 for a double word) PPPPPP : position of the bit in the case of a bit, else 1. Examples: Bit 1 of word 1: \$0101 Word 28: \$1C41 Double word from 32 to 33: \$2081				
Reading format	Bit, word, double word				
Class	☒ No, ☐ Yes				
Grouping of variables	☐ No, ☒ Yes				

Trend – IQ controller



The TREND interface of Xflow allows communication with TREND controllers of the IQ 7x, 9x, 1xx and 2xx type.

Xflow is always integrated into a TREND network via a communication interface called CNC (TREND).

Some IQ controllers incorporate a virtual CNC interface directly (IQ22x, 24x or 25x). To be able to use this CNC, it must first be enabled by programming in the TREND IQ (open the communication port and define the address of the CNC (choose a different address from the IQ)).

For the other types of IQ controllers, an external CNC interface unit is necessary. The electrical format of the link is always RS232.

Note:

On Xflow, TREND communication on a communication port is exclusive (i.e. there cannot be a dialogue with other devices on this communication port).

Once connected to a CNC interface, Xflow can poll any controller present on the network.

Several TREND networks (LANs) can be interconnected (via INC units (TREND)).

Xflow will be able to communicate with an IQ controller present on another network thanks to the LAN address concept included in the address of the TREND peripheral on Xflow.

Connections

Connection between Xflow and a network of TREND IQ controllers is always in RS232 mode.

We describe below the various cases of connection depending on the hardware platform on which Xflow is installed, the communication port used and the type of CNC (external or integrated in the IQ).

On the iRIO equipment, 2 communication ports can be used:

- COM4 (R2-485, second port on the backplane) converted into RS232 via a RIO1 COM, RIO2 COM or RIO2 8AIS card: in this case, connection is to a terminal block.
- COM1 (port of DB9 on the front panel in 3-wire RS-232 (Rx,Tx,Gnd)).

At the level of the TREND IQ controller, connection takes place:

- On the supervisor port (RJ11 connector) of controllers with integrated CNC (IQ22x, 24x or 25x)
- On the DB25 connector of the external CNC units (for controllers without integrated CNC).

Xflow (iRIO) COM4 on terminal block ↔ integrated CNC

Connection between the local iRIO unit and the TREND IQ controller is performed with a specific RJ11 cable (6 wires) on the TREND side and wires to connect the Schneider Electric equipment used to the RIO terminal blocks.

Xflow terminal block for COM4 link via

RIO 8AIS	RIO1 COM	RIO2 COM	RIO UPS2	
10+	3+	6+	Tx	Tx
11-	4-	8+	Gnd	Gnd
10-	3-	6-	Rx	Rx

RJ11 connector to be connected to the fixed RJ11 connector of the TREND IQ controller

6	Rx (blue)
5	(yellow)
4	DTR (green)
3	(red)
2	Gnd (black)
1	Tx (white)



Xflow (iRIO) COM4 on terminal block ↔ external CNC

Connection between the local iRIO unit and the TREND IQ controller is performed with a specific DB25 male cable on the TREND side and wires to connect to the RIO terminal blocks depending on the Schneider Electric equipment used.

Xflow terminal block for COM4 link via

RIO 8AIS	RIO1 COM	RIO2 COM	RIO UPS2	
10+	3+	6+	Tx	Tx
10-	3-	6-	Rx	Rx
11-	4-	8+	Gnd	Gnd

DB25 male connector to be connected to the DB25 female connector of the CNC unit

3	Rx
2	Tx
7	Gnd
5	
20	

Link					
■ Serial	■ 232	☐ 485	☐ Open loop	☐ Current loop	☐
	Bits	■ 8	☐ 7		
	Parity	■ Even	■ Odd	☐ No parity	
	Stop	☐ 0	■ 1	☐ 2	
	Speed	9600 (integrated CNC) – 1200, 4800 or 9600 (external CNC)			
☐ Modem					
☐ Ethernet		☐ TCP (port)		☐ UDP (port)	
Peripheral					
Type			Trend API		
Address			x:y:z		
x: address of Xflow on the TREND network. This address corresponds to the address of the CNC interface. In the case of an integrated CNC it is the supervisor address programmed in the IQ, else the address is given by the address microswitches on the CNC. y: address of the network (LAN) on which the IQ is installed. If the IQ is on the same network as the CNC: y=0 z: address of the IQ controller (given by the address microswitches on the IQ controller). Example: 17:0:1 Comment: addresses 2, 3 and 10 are prohibited by the TREND communication protocol					
Gateway			■ No, ☐ Yes		
Failure time delay (in ms)			1000		
Max. number of failures (in ms)					
End-of-frame delay (in ms)			100		
Variables					

The following table describes the Trend PLC data that can be retrieved in the Xflow variables. It also specifies the values to be entered in the configuration fields of a variable depending on the Trend data to be read or written.

Trend Data type (module)	Configuration of Xflow variables			
	Address	Reading format	Storage format	Input/Output
Sensor: S	S1 to Sx ⁽¹⁾	Decimal	IEEE	Input
Digital Input: I	I1 to Ix ⁽¹⁾	Bit	Boolean	Input
Digital Output (Switch: W)	W1 to Wx ⁽¹⁾	Bit	Boolean	Input /Output ⁽³⁾
Set point (Knob: K)	K1 to Kx ⁽¹⁾	Decimal	IEEE	Input /Output ⁽³⁾
Command (Driver: D)	D1 to Dx ⁽¹⁾	Bit or decimal ⁽²⁾	Boolean or IEEE ⁽²⁾	Input /Output ⁽³⁾

(1): x (maximum number of data of this type on the Trend PLC) depends on the Trend IQ controller connected.
The number of data by type of IQ controller is summarize in the following table.

(2): the commands (or drivers (D)) are programmed in the Trend as either logical type or analogue type.

The configuration of commands in the Xflow variables therefore depends on their programming in the Trend.

(3): the Trend data accessible in write mode can be either read only by Xflow → variable on "Input" or read and controlled by Xflow → variable on "Input/Output".

Number of data accessible per module and per type of IQ controller

Module	Trend IQ controller									
	IQ7x	IQ9x, 10x	IQ111	IQ131	IQ151	IQ204	IQ21x	IQ22x	IQ24x	IQ25x
S	12	32	32	32	48	32	12	32	48	96
I	12	32	32	32	48	32	12	32	48	96
W	6	20	20	20	20	60	10	20	20	60
K	6	25	30	30	30	60	10	30	30	60
D	8	12	12	12	32	12	8	12	32	64

OPC client

This type of peripheral is available only for the Windows NT/2000/XP versions of Xflow.

The OPC Client option does not include the cost of purchase, installation and support for a possible OPC server, which depends on the PLCs and peripherals connected.

In Xflow, the OPC option does not require additional resources; on the other hand, in many cases, the OPC server will be installed on the same PC as Xflow, and will use additional resources, and in some cases dedicated interfaces or peripherals. To operate, the OPC Client driver requires that the OPC Client Data Access components be installed on the Xflow system. These components are available on the website of the OPC Foundation.

Xflow manages the Data Access 2.0 interface defined by the OPC Foundation, and through this interface allows access to the values (of Boolean floating point double precision type) of an OPC server, in read and write modes. These variables are then seen on the Xflow side as normal variables, having all the Xflow functionalities.

OPC contacts: OPC Foundation, <http://www.opcfoundation.org/>

Driver name	OPC client
Manufacturer	–
Model	–
Protocol	Data Access 2.0 under DCOM
Direct access	No pages in direct access
Peripheral	
Type	OPC client
Name	Name of OPC server
Address	Name of OPC server (from release 1.7.6 up)
NB: the name of the Xflow peripheral must correspond to the name of the OPC server; on the Xflow side, this name is limited to 20 characters; if the name of the OPC server is more than 20 characters, it is possible to rename it in the registry or more simply reinstall it with a name limited to 20 characters. The peripheral must be linked to a functional communication resource, of standard type.	
Variables	
Channels	☐ No, ☒ Yes
Address	Name of the OPC tag on the server (this field is limited to 32 characters on Xflow)
Reading format	Automatic

SunEzy

This type of peripheral can be used to dialogue with inverters of the SunEzy range..

Driver name	SunEzy
Manufacturer	Schneider Electric
Model	SunEzy
Protocol	
Direct access	The Web interface of Xflow proposes pages for direct access to this type of peripheral
Link	
☒ Serial	☒ 232 ☒ 485 ☐ Open loop ☐ Current loop
	Bits ☒ 8 Parity ☐ Even ☐ Odd ☒ No parity
	Stop ☐ 0 ☒ 1 ☐ 2 Speed 9600
☐ Modem	
☐ Ethernet	☐ TCP (port) ☐ UDP (port)
Peripheral	
Type	SunEzy, SE600E (old protocol), SE2800 (old protocol)
Address	Automatically assigned by Xflow.
Serial number	Enter the serial number of the inverter to be connected or leave this field empty. If the field is left empty, Xflow will connect to the first inverter replying to the connection signal and will update this field to the value of the serial number of the inverter connected.

Variables

Xflow proposes the list of variables available on this peripheral type, the **address** and **reading format** fields do not have to be filled in by the user. Xflow manages the optimized reading of variables on this peripheral.

Specific peripherals

Xantrex

Yokogawa

Xantrex

This type of peripheral can be used to dialogue with Xantrex inverters.

Driver name	Xantrex
Manufacturer	Xantrex/Schneider Electric
Model	Xantrex
Protocol	2 protocols (GT100E,250E,500E or GT30E)
Direct access	The Web interface of Xflow proposes pages for direct access to this type of peripheral

Link				
☒ Serial	☐ 232	☒ 485	☐ Open loop	☐ Current loop
	Bits	☒ 8	☐ 7	
	Parity	☐ Even	☐ Odd	☒ No parity
	Stop	☐ 0	☒ 1	☐ 2
	Speed	9600		

☐ **Modem**

☒ **Ethernet** ☒ TCP (port)

☐ UDP (port)

Peripheral

Type Xantrex (GT500E, GT250E, GT100E)
Xantrex (GT30E)

Address Not applicable.
If more than one Xantrex peripheral, use the TCP/IP link.

Serial number

Variables

Xflow proposes the list of variables available on this peripheral type, the **address** and **reading format** fields do not have to be filled in by the user. Xflow manages the optimized reading of variables on this peripheral.

Yokogawa

This type of peripheral can be used to dialogue with Yokogawa PLCs.

Driver name	Yokogawa
Manufacturer	Yokogawa
Model	FA-M3
Protocol	
Direct access	The Web interface of Xflow proposes pages for direct access to this type of peripheral

Link				
☒ Serial	☒ 232	☒ 485	☐ Open loop	☐ Current loop
	Bits	☒ 8	☐ 7	
	Parity	☐ Even	☐ Odd	☒ No parity
	Stop	☐ 0	☒ 1	☐ 2
	Speed	19200		

☐ **Modem**

☐ **Ethernet** ☐ TCP (port)

☐ UDP (port)

Peripheral

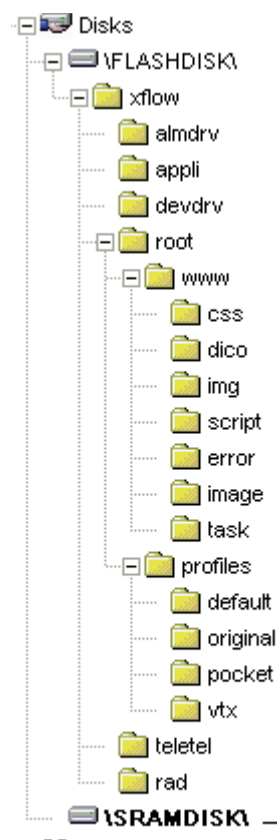
Type API FA-M3/Yoko

Address Address of the PLC in the form "X, Y".
X: Address of the PLC CPU
Y: Address of the station.

Variables

Xflow proposes the list of variables available on this peripheral type, the **address** and **reading format** fields do not have to be filled in by the user. Xflow manages the optimized reading of variables on this peripheral.

Organization of Xflow files	100
On an iRIO	100
On a PC	100
.cst, .wst configuration files	101
Algorithm for selection of configuration file when starting Xflow	101
Saving a configuration on PC	102
Xflow on PC	102
Xflow on iRIO	102
Printing and editing a configuration	103
Downloading a configuration from a PC to Xflow	103
Xflow on iRIO	103
Xflow on PC	103
Erasing a configuration	103
On iRIO	103
On PC	103
Configuration cloning with Kervisu	104
Downloading an image for a synoptic	104
Xflow on iRIO	104
Xflow on PC	104
Downloading a logo	105
Analysis of traffic on a link	105



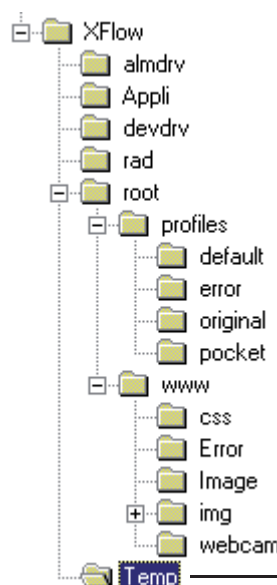
DEBUG.LOG	10135
XFlow.wst	4541
Temp.dat	240016
CHAUF.dat	6416
TEMP_HOR.dat	160016
STARTX.LOG	9480

*.dat: history files
Trace.log: communications trace
Synthalm.alm: alarms
Xflow.wst: configuration file

On an iRIO

Important files

INDEX.HTM	Connection page (\flashdisk\xflow\root\www\)
HOME.XML	Home page (\flashdisk\xflow\root\profiles\original)
KWCONF.XML	Indicates the paths of the directory in which are located the pages and images according to the profiles (\flashdisk\xflow\)
GRAMMAR.XML	Correspondence between the names indicated in the Web pages and the column names of the Xflow tables (\flashdisk\xflow\)
XFLOW.WST	Current configuration file (\sramdisk\)
XFLOW.CST	Default configuration file (\flashdisk\xflow\), can be used to start up if xflow.wst is damaged or missing
XFLOW.EXE	Execution file of the Xflow application (\flashdisk\xflow\)
SYNTHALM.ALM	Summary of current alarms, exists only if there is an alarm file (\sramdisk\)
TRACE.LOG	Trace of communications on the links (\sramdisk\)
*.DAT	History files (\sramdisk\)
LOGO.GIF	Schneider Electric logo in the top left-hand of each page (\flashdisk\xflow\www\img\)



Températures.dat
Test PGH.dat
Trace connexions.dat
Trace.log
Synthalm.alm
XFlow.wst

"Files".dat: history files
Trace.log: communications trace
Synthalm.alm: alarms
Xflow.wst: configuration file

On a PC

Important files

INDEX.HTM	Connection page (\xflow\www\)
HOME.XML	Home page (\xflow\profiles\original)
KWCONF.XML	Indicates the paths of the directory in which are located the pages and images according to the profiles (\xflow\)
GRAMMAR.XML	Correspondence between the names indicated in the Web pages and the column names of the Xflow tables (\xflow\)
XFLOW.WST	Current configuration file (\xflow\Temp\)
XFLOW.CST	Default configuration file (\xflow\Temp\), can be used to start up if xflow.wst is damaged or missing
XFLOW.EXE	Execution file of the Xflow application (\xflow\)
SYNTHALM.ALM	Summary of current alarms, exists only if there is an alarm file (\xflow\Temp\)
TRACE.LOG	Trace of communications on the links
"FICHER".DAT	History files
LOGO.GIF	Schneider Electric logo in the top left-hand of each page (www\img\)

An Xflow system generally contains 2 configuration files:

- an "Xflow.cst" file
- and an "Xflow.wst" file.

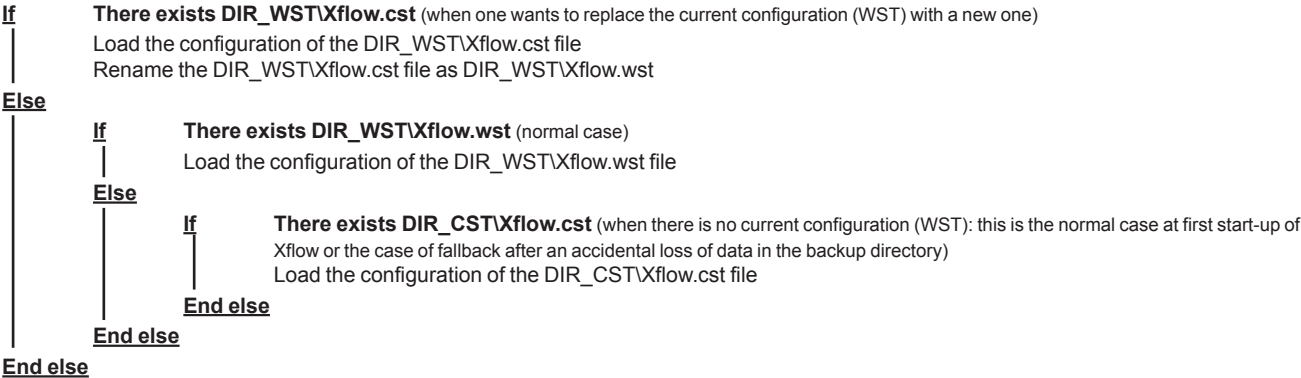
The "Xflow.cst" file is a file that is not intended to be modified. It is present in the directory containing the execution file (on PC).

The "Xflow.wst" file is the last system backup. This backup is performed in the backed up directory every 5 minutes..

System	Directory containing Xflow.Cst (=REP_CST for the algorithm of the following section)	Directory containing Xflow.Wst (=REP_WST for the algorithm of the following section)
PC NT	Installation directory	Installation directory\Temp
iRIO	Flashdisk\Xflow	Sramdisk\

Algorithm for selection of configuration file when starting Xflow

At start-up, the configuration file is selected according to the following algorithm:



The Xflow.Cst and Xflow.Wst files can be opened using an editor such as Notepad.

Maintenance

Saving a configuration on PC

To save a configuration, simply transfer the "Backup directory\Xflow.wst" file to your computer:

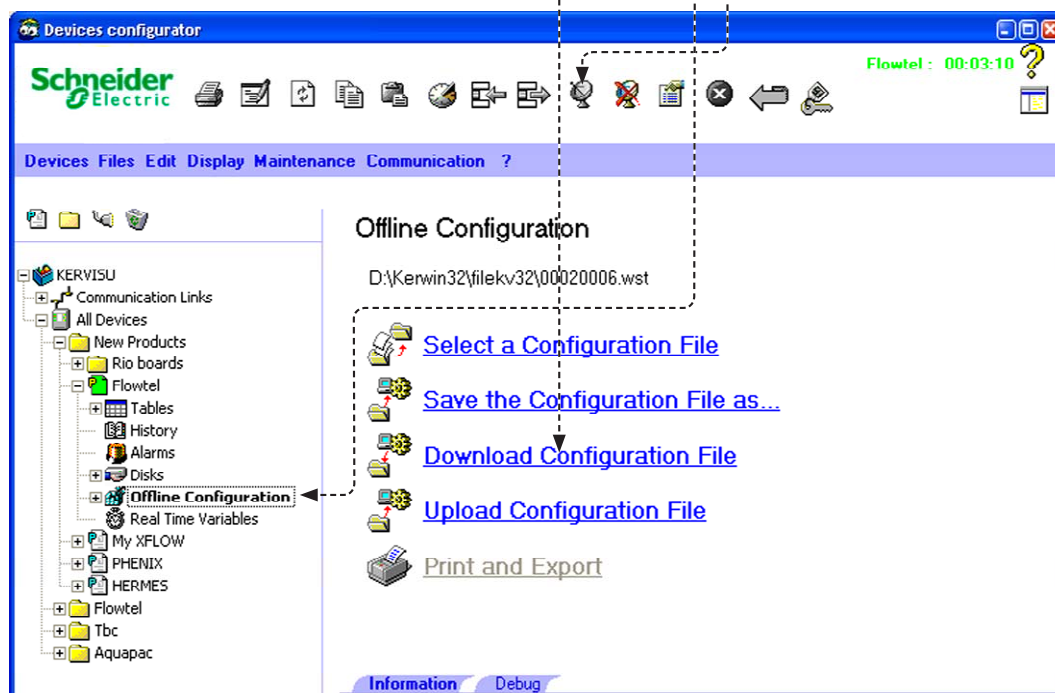
Xflow on PC

From file explorer, copy the Xflow.wst. file

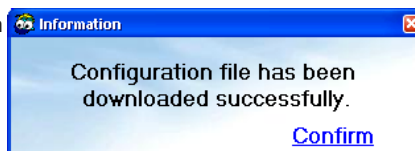
Xflow on iRIO

Using Kervisu:

- Select the peripheral
- Log on as indicated in Chapter 3
- Select "Offline configuration"
- Download the file



then



- Save the configuration file with the name of your choice and in the directory of your choice.



Using a Web browser:

- Log on to the peripheral
- Go to the Configuration > System Parameter menu
- Click on "download configuration"

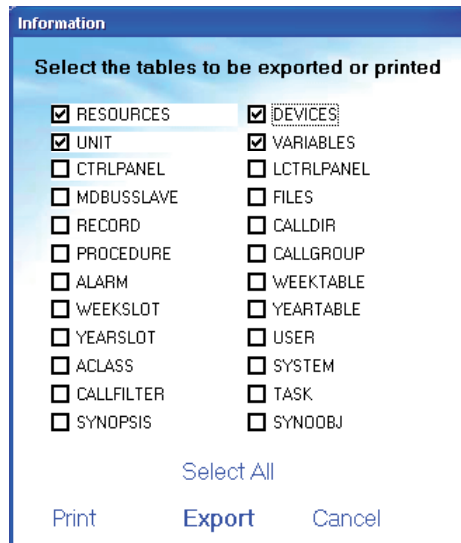


Maintenance

Printing and editing a configuration

Downloading a configuration

Erasing a configuration



Editing a configuration

Printing and editing a configuration

An Xflow configuration can be edited in .pdf format, or printed.

Downloading a configuration from a PC to Xflow

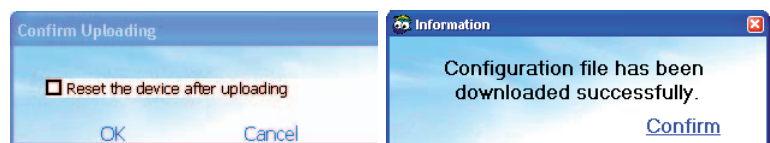
Xflow on iRIO

It is possible to upload an Xflow configuration from a PC using Kervisu:

- Select the peripheral
- Log on as indicated in Chapter 3
- Select "Offline configuration"
- Reload the site configuration file.

 [Upload Configuration File](#)

⚠ Click on Reset and on OK



Xflow on PC

It is possible to upload an existing configuration on an Xflow/PC.

Simply:

- Select a model configuration file in .wst format
- Copy it to the "Installation directory\Temp\" folder.

Erasing a configuration

On iRIO

On iRIO, erasing a configuration in fact involves returning to a default configuration in which there is at least the definition of the links (Console and Modem) which allow logging on to Xflow in local or remote mode.

On this platform, an XFLOW.CST file will be found in the flashdisk (non-volatile memory).

- To restart on this default configuration, use **Kervisu** :
- Retrieve the XFLOW.CST file present in Xflow (\flashdisk\ directory) and store it on the PC
- Upload this XFLOW.CST file from the PC to the \sramdisk\ directory of Xflow (keeping the name XFLOW.CST)
- Check in the \sramdisk\ directory that the two files XFLOW.CST and XFLOW.WST are present
- Provoke a System Reset (Maintenance/System frames/System Reset menu) from Kervisu
- At start-up, Xflow will upload the configuration contained in the XFLOW.CST file to the detriment of the current configuration (XFLOW.WST file).

Note:

The XFLOW.CST file supplied as a standard feature on these two platforms contains no user.
By default, log on with the TEST/TEST user name and password.

On PC

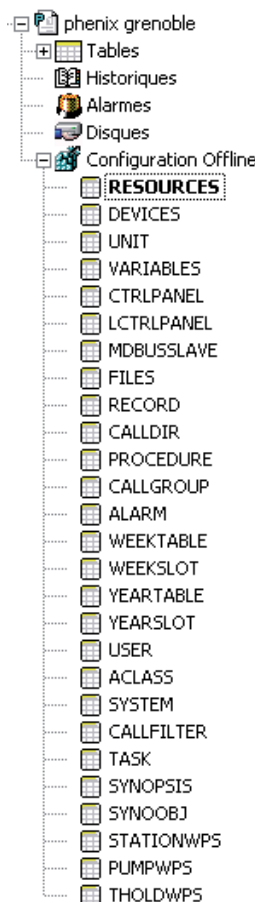
On Xflow PC, there is no need of a minimum configuration to be able to interface by means of a browser or a Kervisu present on the same PC (localhost connection (or to address 127.0.0.1)).

It is therefore possible, before starting Xflow, to delete the XFLOW.WSTfile (in the "Temp" directory present in the Xflow installation directory).

In this case one starts with a blank configuration. Logon to Xflow is performed with the TEST/TEST user name and password.

Maintenance

Configuration cloning with Kervisu Downloading an image for a synoptic



Configuration cloning with Kervisu

It is possible to programme a site using the configuration file for another site. To do so, select the model .wst file, modify it offline, then upload it on the new site.

Procedure in Kervisu:

- Create a new peripheral
- Select "Offline configuration"
- Open a configuration file: select the model .wst file
- View and modify the tables



Add new variables, new peripherals, etc., by inserting rows



Delete variables, peripherals, etc., by deleting rows

Change the titles, addresses, etc., by modifying the interior of the cells

- Save the file under a new name



[Save the Configuration File as...](#)

- Log on to the site.



[Upload Configuration File](#)

■ Downloading an image for a synoptic

This involves transferring a synoptic background image in .jpg or .gif format into the \www\image\ directory.

Xflow on iRIO

Using Kervisu:

- Select the peripheral
- Log on as indicated in Chapter 3
- Select "disks"
- Drag the file from the PC to the flashdisk\root\www\image\ folder of iRIO.

⚠ Avoid using too large an image file which would slow down Web communication via modem: max. 20 kB.

Automatic copy

\FLASHDISK\xflow\root\www\img\

1034 Kb Free space

Name	Size	Date Time
login.gif	1090	08/06/2010 08:29:42
logo.gif	1473	08/06/2010 08:29:42
next.gif	1262	08/06/2010 08:29:42
prev.gif	1261	08/06/2010 08:29:42
ack.gif	133	08/06/2010 08:29:16
ackerr.gif	287	08/06/2010 08:29:16
acright.gif	82	08/06/2010 08:29:16
almfile.gif	132	08/06/2010 08:29:16
arrdown.gif	108	08/06/2010 08:29:16
arrleft.gif	146	08/06/2010 08:29:16
arrow.gif	60	08/06/2010 08:29:16
arrright.gif	123	08/06/2010 08:29:18
arrup.gif	109	08/06/2010 08:29:18
bell.gif	130	08/06/2010 08:29:18
bluedown.gif	114	08/06/2010 08:29:18
cal.gif	127	08/06/2010 08:29:18
cnxfile.gif	132	08/06/2010 08:29:18

D:\COM\Pictogrammes

Name	Size
Energy-infrastructure.zip	325279
Graph-up.emf	824
Graph-up.eps	755248
Graph-up.jpg	984
Graph-up.zip	312643
Logo_SE_Green.gif	1473
Telecontrol.gif	3950
Thumbs.db	10752

Xflow

PC

Xflow on PC

From File Explorer, copy the .gif or .jpg file into the xflow\root\www\image\ folder

Maintenance

Downloading a logo

Analysis of traffic on a link

Downloading a logo

The Schneider Electric Logo present on the logon page and in the top left-hand of each page can be replaced by the same procedure as for uploading synoptic images.

Replace the \www\img\LOGO.GIF and \www\img\XFLOW2.GIF files with files of your choice, taking care to comply with the same dimensions.

 To avoid increasing the time for uploading pages on the browser, the logos should not exceed 2 kB.

Analysis of traffic on a link

It is possible to spy on the traffic on a link, for debugging purposes. All the traffic is in that case saved in a file in the backup directory. The file is called "Trace.log". It is then possible to download it from the device to a PC to examine it.

To initiate a trace, proceed as follows:

- Position yourself on the Web page of the link to be spied on
- Modify the "Trace" parameter as follows:
 - ☐ "One-off": once the file is full, the trace stops
 - ☐ "In loop": trace file management in "rotating" mode (once the file is full, the new data overwrite the oldest data).

To stop a trace, proceed as follows:

- Position yourself on the Web page of the link to be spied on
- Change the "Trace" parameter to "Stop".

Foreword	108
Kerwin SMS type alert medium	108
PCText type alert medium	108
Configuration of a recipient	108
Configuration of an alarm to be transmitted in PCText	108
Configuration of a variable to be transmitted in PCText	108
Teleflo type alert medium	108
Intersite type alert medium	109
Principle	109
Configuration of the recipient	109
Syntax of an intersite message	109
Configuration of the procedure	110
Configuration of the alarm that will trigger the intersite call	110
Configuration of the called site	111
Fax type alert medium	111
Syntax of a fax file	111
Display text	111
Display a bitmap	112
Start a new page	112
End of fax	112

Specific alert media

Foreword

Kerwin SMS, PCText, Teleflo alert media

Foreword

Refer to the "Alert Recipients" section in Chapter 4 "Configuration", for the following alert media:

- Beeper
- FAX2C
- Kerwin central station
- FTP
- Email
- Serial printer
- GSM SMS
- TAP AGCOM (SMS and pagers)
- TAP 7bitspp (SMS and pagers)
- Teletel servers (for France only) (SMS and Pagers).



One can also find there the parameters common to all the recipients.

Kerwin SMS type alert medium

Allows alarms to be sent to Kerwin in the form of SMS messages.

⚠ The Xflow local station must be provided with a GSM modem.

⚠ The Kerwin central station must also be provided with a GSM modem.

Message	Message to be sent. It is formatted automatically by Xflow for sending to Kerwin
Telephone	Telephone No. of the GSM modem on the Kerwin side
Modem initialization string	Leave empty

PCText type alert medium

It is necessary to fill in the "class" section at 3 points:

- Recipient
- Alarm
- Variable

Configuration of a recipient

Phone number	Telephone number of the central station
Modem initialization string	Write nothing for use with iRIO
Class	This field allows the central station to identify the calling site. The field shall mandatorily contain 5 characters , it may contain both letters and figures

Configuration of an alarm to be transmitted in PCText

Class	Document with 2 characters identifying the alarm (for the cyclic alarm, enter 00)
-------	---

Configuration of a variable to be transmitted in PCText

Class	If you want to transmit values of variables during cyclical calls to a PCText central station, supplement with: ■ 6-XX for counting ■ 8-XX for a logical or analogue variable complying with the consistency between variables and associated alarms (if alarms are associated with these variables) in accordance with the following example: ■ Variable CLASS field: 8-56 ■ Alarm CLASS field: 56
-------	---

⚠ **Specific case for a Telyo central station: on the Telyo side, create TM or TC channels with 2 characters, then set the History field to Yes, and finally choose an appropriate display format.**

Teleflo type alert medium

These types of directions allow alarms to be sent to a Teleflo Alarm or an Xflow Alarm (specific Air Liquide hardware and software).

Address	Modbus address of the Teleflo/Xflow Alarm
Logon name	This is a user name that must be located in the table of Teleflo/Xflow Alarm users
Password	Password associated with the user name in the Teleflo/Xflow Alarm
Telephone	Phone number of the Teleflo/Xflow Alarm modem
Modem initialization string	String to be sent to the modem before dialling, if necessary
Class	Not applicable for this medium

Intersite type alert medium

This alert medium allows 2 Xflows installed on 2 different sites to communicate with one another to exchange variable states and to send automatic remote control orders from one site to another.

Principle

Upon an alarm, Xflow calls another Xflow and can perform:

- A remote control order on a variable of the remote Xflow (e.g. if the level exceeds 2.5 m → start-up of a remote pump)
- Replica of the value of the variable at the time of the alarm (e.g. replica of the level value).

The following steps should be complied with:

- Configure a recipient (remote Xflow)
- Configure a procedure in which the recipient is placed
- Configure the alarm triggering the call
- Configure the variables of the remote site.

We shall illustrate the explanation with the following example: if the level exceeds 2.5 m → start-up of a remote pump and indication of the event in an event file of the remote Xflow.

Configuration of a recipient

Message	Message to be sent to the remote Xflow. This message must be less than 160 characters. For the syntax of the messages, see slightly further on.
Address	Modbus Slave No. of the remote Xflow. (must correspond to the address configured in the remote Xflow in "Advanced Settings/System Settings/Modbus Slave address")
Telephone	Phone number of the remote Xflow
Modem initialization string	String to be sent to the modem before dialling, if necessary

Syntax of an intersite message

- Start of message: <FT, "user name of remote Xflow", "user password of remote Xflow"> (by default: <FT,TEST,TEST>)
- Remote control order for a variable (writing): T# "name of remote Xflow variable"# "value to be written"
- Separating character between 2 actions: #
- Transmission of the variable value that triggered the alarm: "name of remote Xflow variable"#&V
- End of message:</FT>

Other functions are possible; please consult us.



English

Site : InterSolar
06/05/10 18:03:34 | Logout

Home page
Dashboard Synoptics Histories Peripherals Configuration

Home page → Configuration → Recipients → Recipient KERWIN_IP

Name	KERWIN_IP	[modify]
Type	GSM/SMS	
Status	locked	
Connection	TERMINAL	
Transmit on normal return	No	
Acknowledgement attempt(s)	automatic acknowledgement	
Message	<FT, TEST,&ZTEST>T#CmdPompe#INiveau#	[modify]
Number of successfull calls	0	
Number of calls failed	1	
Number of active alarms	0	
Time before next call (in sec)	597	
Status of the last connection	IP address incorrect	
Cumulated connection time (sec)		

Procedure on this recipient

[see all procedures]

Name	Level
PROKER	Main recipient

[unlock this recipient]

Specific alert media

Intersite type alert medium

Configuration of the procedure

Name	Name of procedure, at most 20 characters
Addition of a call group	Click on [add a recipient]
Main recipient	The recipient corresponding to the remote Xflow
First backup	Not applicable
Second backup	Not applicable
Max. switchover time	Time in seconds after which, if an alarm has not been sent to a recipient, it switches over to the following recipient



Site : InterSolar
 Home page
 Dashboard Synoptics Histories Peripherals Configuration

English
 06/05/10 18:05:24 | Logout

Home page → Configuration → Procedures → Procedure Remote_site

Name	Remote_site	[modify]
Status	OK	

Recipients attached to this procedure				[add a recipient]
Main	First backup	Second backup	Delay (in s)	
KERWIN_IP	Dest SERV_FTP	KERWIN_IP	No	[modify] [delete]

Alarm attached to this procedure		[show all the alarms]
None		

[lock this procedure]

Configuration of the alarm that will trigger the intersite call

Name	Name of the alarm
Description	Comment with a precise sentence which provides information on the nature and content of the variable
File	Select Alarms
Source	Variable
Reference	Select the variable (e.g.: level)
Type	In the case of the example: >=
Threshold	Value (e.g.: 2.5)



Site : InterSolar
 Home page
 Dashboard Synoptics Histories Peripherals Configuration

English
 06/05/10 18:08:01 | Logout

Home page → Configuration → Alarms → Alarm AL_AB1 RIO UPS.2@241 → Edit

Name	CdePompe	[modify]
Description	Commande pompe sur site distant	
File	ALARMES	
Origin	Variable	
Reference	Meas01	
Procedure	SiteDistant	[modify]
Report	Aucun	
Type	Supérieur à	

Threshold	0
Hysteresis	0.0
Occurrence tempo (sec)	n
formula in the appearance	
Time of disappearance	0
Back-to-normal formula **	
Inhibition alarm *	aucune
Class *	
Severity *	

finish

Specific alert media

Intersite type alert medium

Fax type alert medium

Configuration of the called site

Remote controlled variable (e.g. pump control)

Name	Variable name: must strictly correspond to the name written in the message of the intersite recipient of the calling Xflow (e.g. CntrlPump)
Input/Output	Must be of the Output or Input/Output type

Variable replicating the variable of the calling site (e.g. remote tank level)

Name	Variable name: must strictly correspond to the name written in the message of the intersite recipient of the calling Xflow (e.g. level)
Peripheral	Virtual

Modem link

Protocole idle	Check Napbus
----------------	--------------

Fax type alert medium

File	Full path of the file containing the description of the fax (cf. section on the syntax of a fax description file). The file must be uploaded in the local station in accordance with the procedure described in Chapter 7 "Maintenance".
Telephone	Phone number of the fax
Modem initialization string	Possible initialization string to be sent to the modem before connection

Syntax of a fax file

To send alarms on a fax, you must define what you want to put in the fax. To do so, you must write a text file containing commands enabling the fax driver to make up the pages, and upload it into the "fax" directory of the local station.

A fax can consist of several A4 pages. A page has a resolution of 1728 pixels in width and 2272 pixels in height. The font used by Xflow to make up the text is a non-proportional font. Each character has a width of 20 pixels and a height of 26 pixels. There are 4 types of commands:

T	Display text
B	Display a bitmap
N	Start a new page
E	End of fax

Display texte

To display the text, you must type the following line: **T, x, y, a, "text"**

With:

x = Position in the width of the A4 sheet (0 = completely left)

y = Position in the height of the A4 sheet (0 = completely at the top)

a = Text attribute

text = Text to be inserted. This text may contain meta fields (&...).

The possible attributes are:

Attribute	Value (a =)
Bold	0x01000000
Double height	0x02000000
Double width	0x04000000
Double height Double width	0x06000000
Bold	0x03000000
Double height	
Bold	0x05000000
Double width	
Bold	0x07000000
Double width	
Double height	

As for messages, a "meta field" is a character string starting with &.

Specific alert media

Fax type alert medium

The FAX driver accepts the following meta fields:

&D	Current date
&T	Current time
&F	Fax number. The first fax sent has the number 0. This counter is incremented with each fax sent
&P	Current page
&C	Name of the link used to send the fax
&S	Total number of faxes sent
&E	Error rate as % of faxes sent
&A (index, message)	Retrieves the alarm whose index is specified. 0 means the oldest active alarm, 1 means the following active alarm if it exists, etc. This makes it possible to send several alarms per fax. "Message" is the text written in the fax page and its syntax is the same as for an email message, fax (cf. "Syntax of a message").
&V (Varname, VarMessage)	Retrieves the information from the Varname variable and displays it matching the VarMessage fields. This field has the same syntax as an alarm message but the meta fields which form it are relative to the variable. The possible meta fields are as follows: &N Variable name &V Variable value &U Variable unit &W Value + unit &C Description of the variable

Display a bitmap

To display a bitmap (in grey level bmp), you must type the following line:

B,x,y,0,"file"

With:

x = Position in the width.

y = Position in the height.

file = Full path of the bitmap file. The only format understandable for the driver is black and white bmp.

And then upload it into the "fax" directory (see chapter 7 "Maintenance").

Start a new page

To start a new page, simply type the following command:

1.1.1.1.1.1.1N

End of fax

To end a fax, you must insert the following command: **E**

Straton in brief	114
Benefits of Straton in Xflow	114
Details	114
The software environment	114
The virtual machine	114
The Straton application	114
Interface between Xflow and the Straton variables	114
Limitations	115
Xflow-Straton interfaces	115
Data interchange	115
Straton parameters in Xflow	116
Communications between the Straton software environment and Xflow	117
TCP communication	117
Serial communication	118
The Straton application	119
Main functions in the Straton software environment	119
□ Connection and disconnection	119
□ Downloading of the application	119
□ Real-time viewing and monitoring of the Straton application	119
Real-time limitations	120
Principle of exchange of shared Xflow–Straton variables	120
Limitation due to the refresh cycle for each variable	120
Limitation related to CPU power	120

The Straton option, based on solutions and components from the company Copalp, provides Xflow with powerful functionalities unmatched in the field of remote management: it enables the development, simulation, testing, debugging and documentation of extensions to the Xflow software in accordance with the IEC 61131-3 standard, and this on all the hardware platforms supported by Xflow.

Benefits of Straton in Xflow

Straton allows Xflow users to develop automation applications where the use of calculation variables is no longer reasonable. Now, the virtual variables of Xflow make it possible to very easily develop and debug simple automatic controls (time-proportional control, simple servo controls) but are limited as soon as the functions become rather complex (control of an air conditioning system with multiple-criterion load shedding); for example, the calculation formulae under Xflow do not enable easy implementation of loops or conditional tests, and cannot ensure an order of evaluation of the formulae.

Conversely, the use of a professional software environment, complying with market standards, can ensure a high level of quality, maintainability and scalability, while offering advanced functions: graphics editor, simulator, debugger, automatic documentation of applications, and portability from one Xflow application to another.

Straton also provides Xflow with an openness that goes far beyond the framework of automatic control. One of the five languages supported, ST (Structured Text), is similar to Pascal and can enrich Xflow with new functions.

Details

There are three different components in the Straton offer integrated with Xflow:

- The software environment, or workbench
- The Straton kernel, or virtual machine
- The Straton application.

The software environment

This is the development environment on PC (Windows NT, 2000 or XP) which allows Straton applications to be developed in one of the 5 languages defined by the IEC 61131-3 standard:

- SFC: Sequential Function Chart (Grafcet)
- FBD: Function Block Diagram
- LD: Ladder Diagram
- ST: Structured Text
- IL (Instruction List): text editor.

This environment comprises:

- A graphics editor for each of the languages
- Compilers which can generate pseudo-code
- A simulator which allows the application to be tested before downloading it to the target
- A debugger which allows debugging of the application once it has been downloaded and run by the virtual machine of the Phenix Xflow target (in particular it makes it possible to run the application in cycle-to-cycle mode or else change the application's cycle time)
- Real-time viewing and modification of Xflow variables when the software environment is connected to an Xflow/Straton
- An automatic documentation generator for the application.

The virtual machine

This is the software component integrated into Xflow which makes it possible to:

- Execute the pseudo-code of a Straton application
- Communicate with the Straton workbench
- Establish a link between the Xflow variables and the variables defined in the software environment.

The Straton application

This is the application developed in one of the 5 IEC languages which is compiled in the development environment and then downloaded to Xflow. A file containing the pseudo-code corresponding to the application is then obtained: "myappli.cod"; this file contains a description of the Xflow variables used in the application and the instructions that will be executed by the virtual machine.

Interface between Xflow and the Straton variables

- The Straton virtual machine and Xflow exchange information exclusively via their respective variables, recognized by their name. Xflow also performs automatic creation of new variables when they do not exist at start-up of a Straton application, and the Straton variables are identified in Xflow by the  icon.

Straton setup

Straton in brief

Xflow-Straton interfaces

Limitations

Straton does not convert Xflow into a PLC: Xflow performs more functions than the mere acquisition of inputs/outputs and the execution of a program on those inputs/outputs: native management of numerous protocols, historizing, alarms and standby duty, Web presentation, remote access.

This plurality of functions has led to implementation choices not specifically favouring the acquisition cycle, and not synchronizing the cycle of acquisition of variables by Xflow with the processing cycle of the Straton virtual machine, which in practice limits the type of applications developed under Straton for Xflow to soft real-time dependent on the Xflow cycle time.

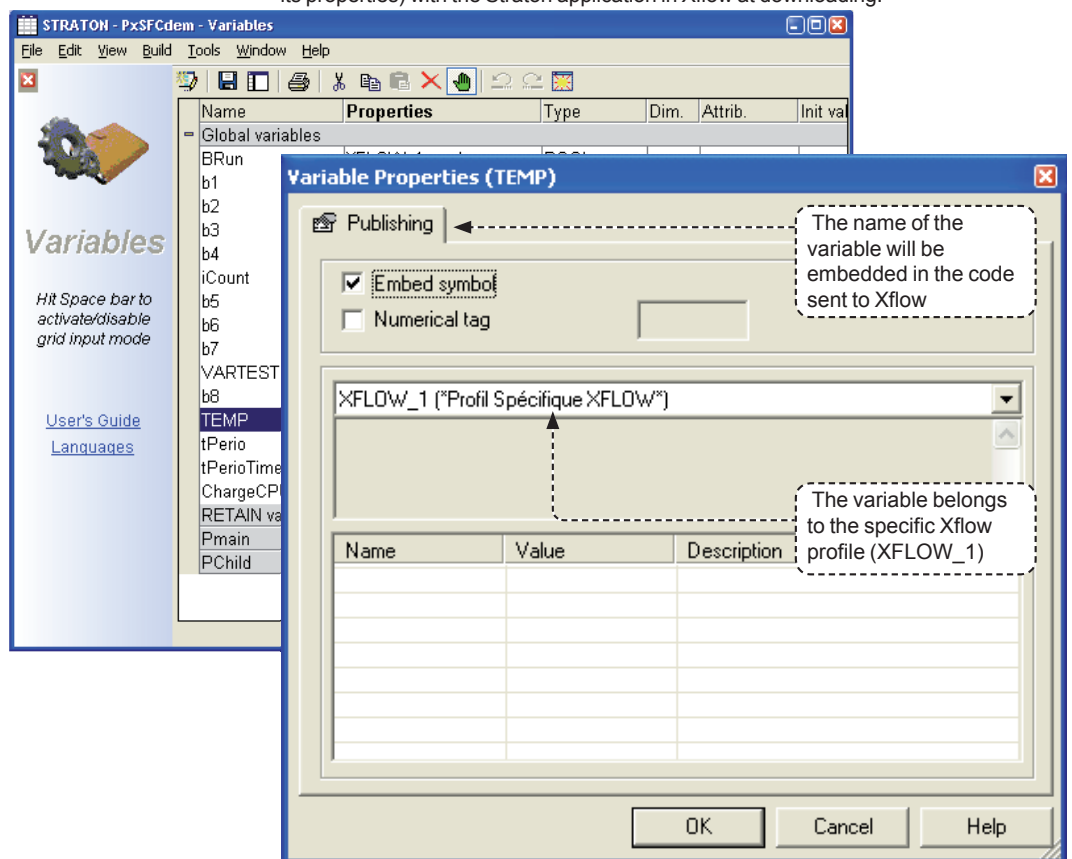
Xflow-Straton interfaces

Data interchange

The two applications, Xflow and Straton virtual machine, exchange their data **exclusively** via their respective **variables**.

For an Xflow variable to be accessible by Straton, in the Straton workbench you must:

- Give it the same name as in the Xflow configuration
- Associate an Xflow variable profile with it
- Specify that the name of the Straton variable must be embedded (possibly with its properties) with the Straton application in Xflow at downloading.



In Xflow, the Straton variables must be defined in the table of variables before uploading the application.

Xflow is capable of recognizing the Straton variables which can be found in the *.cod application file. When the application is loaded in Xflow, the variables of the Straton application are **automatically created** by Xflow in its table of variables.

The variables are created with the same name and the same **properties** as the application variables. In addition, the variables are marked with the Straton status  (icon) and with the description "Straton Variable automatically created".

If no application is loaded, all the Straton variables will be **unmarked** but they will not be **removed** from the table of variables.

Home page → Configuration → Variables 

Variables with state on a peripheral

#	Status	I/O	Variable	Description	Value
0			CHARGECPU	STRATON Variable automatically created	67.00
1			TPERIO	STRATON Variable automatically created	100
2			B8	STRATON Variable automatically created	0
3			B7	STRATON Variable automatically created	0
4			B6	STRATON Variable automatically created	1
5			B5	STRATON Variable automatically created	0
6			ICOUNT	STRATON Variable automatically created	6901907
7			B4	STRATON Variable automatically created	0
8			B3	STRATON Variable automatically created	0
9			B2	STRATON Variable automatically created	0
10			B1	STRATON Variable automatically created	0
11			BRUN	STRATON Variable automatically created	1

Note: the creation of specific profiles is handled exclusively by Schneider Electric, because, in parallel to the creation of a profile in the Straton software environment by means of the Straton Library Manager, it requires a development in the target to recognize this new variable profile.

A single specific Xflow Schneider Electric profile has been created (Xflow_1). It contains no particular property. It must be made visible to the Straton software environment (by creating it and exporting it to the software environment from the Straton library management utility).

 The specific Schneider Electric profile is not present by default at installation of the Straton software environment on the PC.

Straton parameters in Xflow

The operating parameters of a Straton application are defined in the System table of Xflow, accessible via Kervisu or from a browser.

These parameters allow you to:

- Define the type of communication between the Straton software environment (PC) and Xflow (TCP/IP or Serial)
- Specify a port number for the case of TCP/IP communications
- Give the name of the Straton application to be run at start-up of Xflow
- Indicate the type of start-up to be performed.

In Xflow, the parameters intended for Straton are given by additional lines in the System table.

If parameters are not present in the System table, default values are assigned to them. The following table shows the lines to be added to the System table for each parameter and the default value adopted by said parameter if it is not present in the table.

Parameter	"Name" column in System	"Value" column in System	Default value if not in System
Type of communication	T5_COMM	TCP/SERIAL	"SERIAL"
TCP port No. (TCP comm)	T5_TCP_PORT	Numerical value	1100
Name of Straton application to be run	T5_APPLI	Application filename (without extension)	"T5"
Type of start-up ⁽¹⁾	T5_START	COLD/HOT/WARM	"WARM"
Straton virtual machine cycle ⁽²⁾	T5_CYCLE	Numerical value in ms (between 10 and 100000)	100 ms

(1) Note on the type of application start-up:

COLD: start-up on database and all initialized variables

WARM: start-up with initialized database but with reloading of saved variables (Retain)

HOT: start-up on current database and saved variables.

(2) This cycle time represents the period for invocation of the Straton virtual machine task. This value should be adapted according to the Xflow configuration and the Straton application. An excessively low value may cause poor functioning of the system.

Configuration of the T5_APPLI variable in the System table (Kervisu interface)

II°	NAME	VALUE	ACCESS
0	IP_ADDRESS	172.16.1.250	Level 0
1	IP_MASK	255.255.255.255	Level 0
2	IP_GATEWAY	255.255.255.255	Level 0
3	DEF_CALL_FILTER	1	Level 0
4	T5_COMM	SERIAL	Level 0
5	T5_TCP_PORT		Level 0
6	T5_APPLI	straton	Level 0
7	T5_CYCLE	100	Level 0

Configuration of the T5_APPLI variable in the System table (Web interface)

				
Site : InterSolar Home page Dashboard Synoptics Histories Peripherals Configuration				
Home page → Configuration → Database → Table SYSTEM				
ID	NAME	VALUE	ACCESS	
0	IP_ADDRESS	10.195.42.27	Level 0	
1	IP_MASK	255.255.255.224	Level 0	
2	IP_GATEWAY	192.168.100.30	Level 0	
3	DEF_CALL_FILTER	1	Level 0	
4	NAME	InterSolar	Level 0	
5	MODBUS_ADDR	10	Level 0	
6	IP_PRIMARY_DNS	255.255.255.255	Level 0	
7	T5_APPLI	Straton	Level 0	

Communications between the Straton software environment and Xflow

The Straton software environment allows connection to Xflow in real time, in local or remote mode, to perform the following actions:

- Download the application and run it directly in Xflow
- Rapidly test the application in Xflow
- View application progress in real time in Xflow
- Modify the application parameters in real time.

Communication between Xflow and Straton can therefore take place in local mode (TCP or serial) and remote mode (TCP).

Configuration of the link between Xflow and the Straton software environment is performed by means of the Xflow system table. The T5_COMM variable in the system table indicates the communication mode to be used. By default, communication takes place in serial mode.

NB: Xflow must be restarted for the communication parameters to be taken into account.

On a given TCP link, it is possible to be connected via the Web and with the Straton software environment.

■ TCP communication

The T5_COMM variable in the system table has the value TCP.

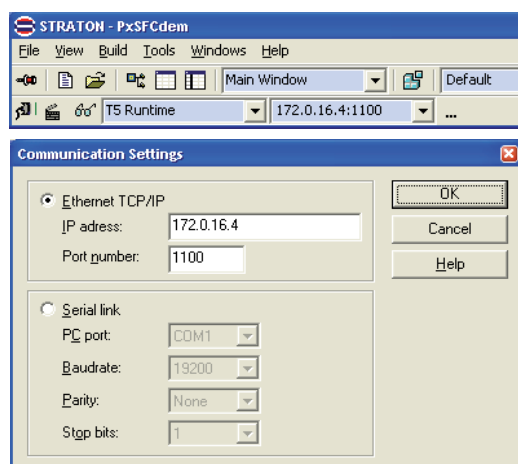
Moreover, it is necessary to enter the TCP port to be used with the T5_TCP_PORT variable (by default 1100).

Xflow is automatically listening to a Straton protocol on this TCP port.

There is no need to configure the link table.

NAME	VALUE
IP_ADDRESS	172.0.16.4
DEF_CALL_FILTER	1
T5_APPLI	pxsfcodem
T5_CYCLE	10
T5_COMM	TCP
T5_TCP_PORT	1100
IP_MASK	255.255.0.0

Corresponding configuration in the System Xflow table



Configuration of a TCP link from the Straton software environment

■ Serial communication

The **T5_COMM** variable of the system table in Xflow has the value **SERIAL** (this is the default value).

On the Xflow side, the link chosen for communication with the Straton software environment must be placed on automatic detection of the Straton protocol.

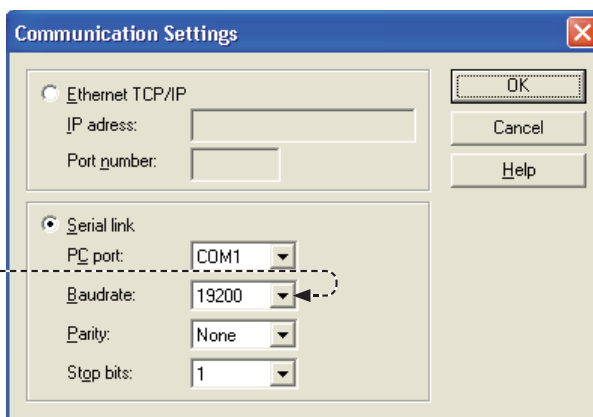
Unlike the PPP, Napbus and Videotex protocols, the Web page of the link proposes no check box for the Straton protocol.

To authorize the Straton protocol on the link, you must go through **advanced configuration** → **Database** → **RESOURCES** table, **LISTEN** field and add 32 to the value already present in this field (e.g. if the value for the LISTEN field of the link to be connected to the Straton software environment equals 3 (PPP and Napbus already in listening mode), you must write 35 there).

PC side, Straton software environment, Choose the "Serial link" type



- Choose the baud rate in accordance with the idle speed settings in the Xflow link. If the choice 115200 does not appear in the list, it is possible to type 115200 directly in the main window
- Choose Parity = None
- Choose Stop bits = 1



Note:

On a serial type link, it is impossible to have a Straton session and a Web or Napbus session in Xflow simultaneously.

When communication with the Straton software environment stops, the link is not released automatically.

This link becomes available again for automatic detection of another protocol (PPP or Napbus) after 5 minutes without receiving Straton frames.

The Straton application

A Straton application in Xflow takes the form of a *.cod file, compiled in the development software environment, which is then downloaded either directly by the software environment or from Kervisu.

When a *.cod file is downloaded from the development software environment, the System table of Xflow is automatically updated; if the *.cod file is sent by Kervisu, the System table must then be updated by entering the name of the application (T5_APPLI variable) and then causing resetting of Xflow. The filename, without an extension, should not contain more than 8 characters.

Under Phénix, the *.cod files are located in the saved memory, \sramdisk disk, in the same space as that reserved for configuration and the history files.

Main functions in the Straton software environment

■ Connection and disconnection

Connect the Straton software environment to Xflow



■ Downloading of the application

Download the *.cod application to the Xflow disk

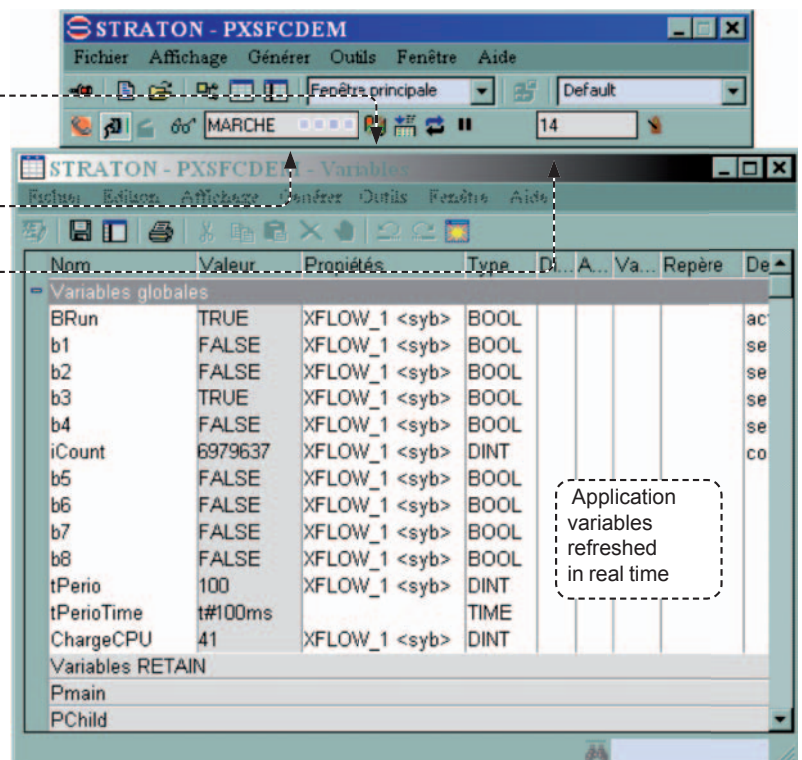


■ Real-time viewing and monitoring of the Straton application

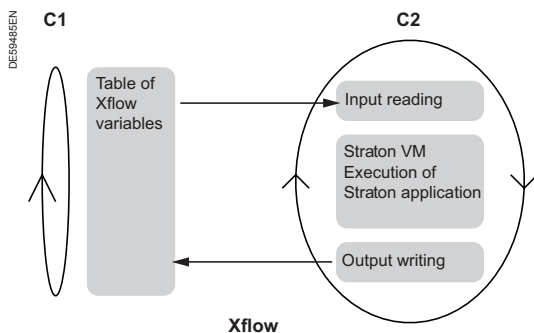
Stopping/restarting the application

Application state

Duration of last cycle of the application (ms)



Application variables refreshed in real time



Real-time limitations

Principle of exchange of shared Xflow-Straton variables

Straton VM: Straton Virtual Machine

C1: Xflow variable refreshment cycle

C1 depends on the configuration; in fact each variable has its own cycle.

On a configuration with a single RIO I/O card, the cycle time is at best 50 ms.

Every 50 ms, a variable (or a group of variables) is selected to be refreshed.

Selection of the variable to be refreshed is performed in accordance with the following order of priority:

- Write requests
- The variables for which the acquisition period is defined by the configuration
- Among the variables to be refreshed "as soon as possible" ("acquisition period" field left at 0), the variable module selects that for which the date of last acquisition is the oldest.

C2: Straton cycle

A Straton cycle:

- Retrieval of the values of the input variables of the Straton application: reading of the value of the corresponding variable in the Xflow database and replication of this value in the Straton database.
- Execution of the pseudo-code of the Straton application: for a Grafset, for example: execution of steps, until an inactive transition is come across.
- Updating of output variables: reading of the values of output variables in the Straton database (they may have been modified by the code of the Straton application) and replication in the value of the corresponding Xflow variables (in the Xflow database).

Limitation due to the refresh cycle for each variable

If cycle C2 of the Straton machine (imposed by the downloaded Straton application) is shorter than the refresh cycle of the Xflow variables used:

- The input values given to Straton before running the cycle will not necessarily have been physically refreshed since running the last cycle
- If Xflow outputs are modified at each Straton cycle, the variable module will be able to satisfy only the write requests (priority over reading). Refreshment of the inputs will therefore be disturbed.

Limitation related to CPU power

The cycle time is imposed by the Straton application. This cycle time corresponds to the period for invocation of the task containing the Straton virtual machine. If the time needed for execution of the application code becomes greater than this cycle time, Straton nevertheless completes its cycle, but the following cycle will continue immediately.

In this situation, it is easy to understand that the CPU no longer has time available for the remainder of the application. The processor's maximum capacity is reached.

In fact, the Phenix OS nevertheless allows execution of the other tasks, so the application is not blocked (communications continue to operate ...); however, the overall performance of the application may be slowed down (refreshment of variables ...).

A protection is provided to ensure satisfactory operation of Xflow irrespective of the Straton application run. In fact, whatever the cycle time required by the Straton application, Xflow imposes a cycle of at least 100 ms by default.

In some cases this minimum time may be far too great.

That is why this minimum time is configurable in the "System" table (cf. T5_CYCLE row).

You can go down to 10 ms, or even less, if you want to give priority to the Straton cycle, but make sure to correctly validate the Xflow application as a whole (check correct refreshment of the variables and check the CPU load (System variable)).

Schneider Electric Industries SAS
Schneider Electric Telecontrol
839 Chemin des Batterses
Z.I. Ouest
01700 St Maurice de Beynost
Tel.: +33 (0)4 78 55 13 13
Fax: +33 (0)4 78 55 50 00
<http://www.schneider-electric.com>
E-mail: telecontrol@schneider-electric.com

As standards, specifications and designs change from time to time, please ask for confirmation of the information given in this publication.



*This document has been printed
on ecological paper*

Publishing: Schneider Electric Industries SAS
Production: Graphème
Printing: Made in France