INSTALLATION AND OPERATING MANUAL

EN

MODBUS TCP Card

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CONTENTS

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This licence does not grant the right to receive software updates, or new versions.

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This contract is subject to French law.

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2. ELECTRONIC EMISSION NOTICE

2.1. Federal communications commission (FCC)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

- CE Notice

This device complies with the EMC directive of the European Community and meets or exceeds the following technical standard:

- EN 55032:2015/A1:2020, Class B – “Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment.” This device complies with the CISPR Class B standard
- EN IEC 61000-3-2:2019/A1:2021 – “Electromagnetic compatibility”

3. SAFETY INFORMATION

- All servicing of this equipment must be performed by qualified service personnel. Remove rings, watches, and other jewellery before servicing the unit.
- Before plugging in/pulling out the interface card to/from the UPS or STS, please make sure that the power supplying the UPS has been switched off or on maintenance bypass for MASTERYS, MODULYS and DELPHYS UPS. Hot swap of the interface in UPS or STS is inhibited.

4. GENERAL DESCRIPTION

4.1. MODBUS TCP Card presentation

The MODBUS TCP Card allows UPS communicating to monitoring system through MODBUS TCP IDA protocol.

This interface allows up to 3 TCP sessions simultaneous.

In addition, a RS485 MODBUS RTU serial link is available via RJ45 connector. Point to point connection up to 10 meters recommendation.

4.2. SOCOMEC UPS compatibility

This interface is compatible with all SOCOMEC UPS and STS having COM-Slot port available.

	**NOTE!** **This interface is not suitable for SOCOMEC NETYS and ITYS UPS range**

4.3. MODBUS TCP Card features

- Web user interface
- Configuration page for IP settings
- Control page to enable/disable network services (DHCP, HTTPs, SSH, …)
- Date and time to synchronize the interface event log. This NTP connection doesn't allowed to synchronize the UPS or STS internal clock.
- MODBUS configuration page
- MODBUS debug page: check MODBUS frames between interface and UPS or STS

4.3.1. Network services

- Assigned IP automatically via DHCP
- 10/100 and 1Gbps fast Ethernet auto-sense network environment
- Configuration utility simplifies the FW update process

4.3.2. Network protocols

- IPv4
- TLS 1.3
- HTTP/HTTPs with certificate
- DHCP / BOOTP
- SSH v2
- NTP
- MODBUS TCP

5. 2. REQUIREMENTS

5.1. Web browser

Used for user interface.

5.2. NET VISION Explorer (≥ v1.0.63.1)

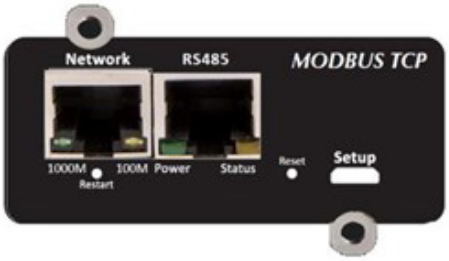
This tool must be installed in a Windows™ computer to configure IP settings, to upload the interface configuration, or to upgrade the FW. Please refer to the Appendix.

NET VISION Explorer detects all interfaces connected only on the same local network.

This tool helps to check the IP addresses of each interface.

6. MODBUS TCP CARD INSTALLATION

MODBUS TCP Card



MODBUS TCP Card is installed and screwed into one of the available COM-Slots.

The card is powered by the UPS or STS and communicates through serial link to the internal control board of the device.

The serial link port must be enabled and set on the Local control panel to establish the communication.

WARNING: Before installing the card, please note its MAC address: the 6 last characters used as admin password for the first connection to user interface.

7. SERIAL LINK SETTINGS

The Interface communicates with the UPS or STS via RS232 serial link. The baud rate is detected automatically during boot sequence.

It is possible also to change it in the configurations page.

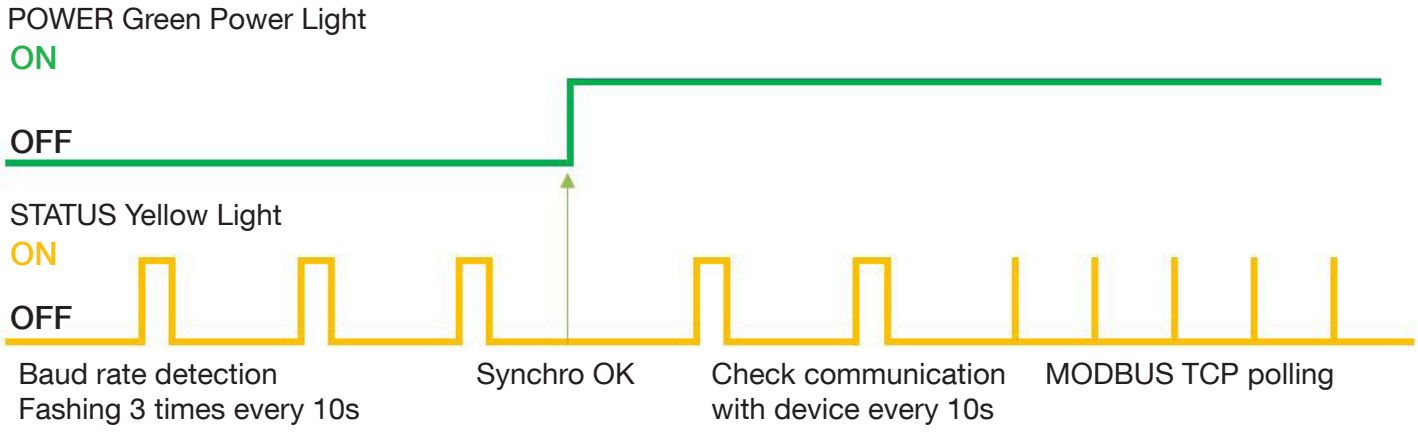
The com-slot port used for the interface must be set as following through local control panel (HMI):

- baud rate: 57600, 19200 or 9600 according to UPS and STS range
- slave number: 1
- no parity
- 1 stop by default

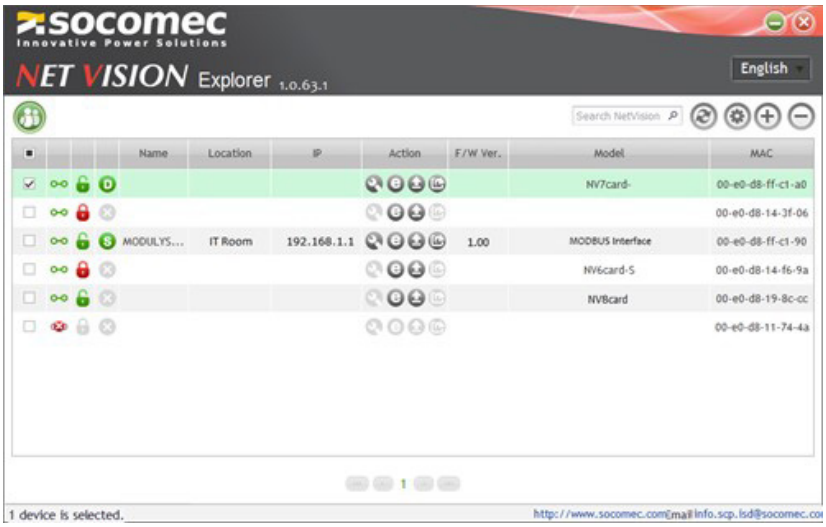
8. BOOT SEQUENCE

During starting phase - boot, the RS485 Power led is OFF and RS485 Status led flashing during baud rate detection. the Power led switches to ON once communication is established with the correct baud rate.

Then the Status RS485 led is ON when the interface is sending MODBUS request to the device.



9. NET VISION EXPLORER



9.1. IP Settings

Click on for IP settings.

9.2. Browse

Click on open default browser and open the login popup to access to MODBUS TCP web interface.

9.3. Firmware Upgrade

Click on for FW upgrade.

10. IP ADDRESS CONFGURATION

10.1. Default IP address

If a DHCP server is available on the same Network as the interface, it will request a valid IP address from the server. If the DHCP server is not available, it switches to the following default IP address: 192.168.7.18.

10.2. User interface access

When the interface has a valid IP address, open the web browser and enter the IP address set manually or given by the DHCP server. The IP address can be checked with the NET VISION Explorer software utility (see NET VISION explorer §).

It requests always a login and password account before accessing to web pages.

Default admin credentials at first connection:

Login: admin,

Password: 6 last Char of MAC address for the first access.

After first login, a new password is requested and then a new session login popup appears.

10.3. IP settings using network if DHCP not present

Even if DHCP is not available, the IP address can be set through the NET VISION Explorer tool.

10.4. IP settings using a terminal and USB

On a Window® PC (starting from version 10) the COM port is automatically selected.

Once the device is recognized and COM port detected, open an SSH terminal connection to modify IP settings.

11. RESET FACTORY SETTINGS

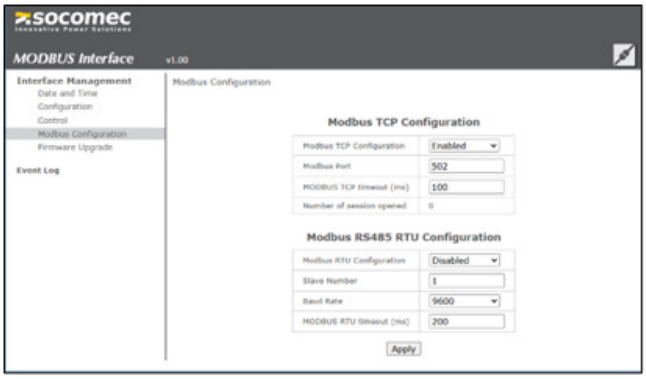
'Restart' on board push button: HW reset, Power off / on

'Reset' on board push button:

Restart System:	Press 1 ~ 3 second
Reset Account and Password to Default Value:	Press 3 ~ 6 seconds
Reset to Factory Default Value:	Press Over 6 seconds

12. USER INTERFACE

12.1. Home page



12.2. User login

The login status is given by following icons:

- Not logged
- Logged

Click on the button to open a session or to close the current session.

Login popup:

12.2.1. Admin account management:

- the password is set with the 6 last char of its MAC address at first connection after installation or after factory reset command.
- the initial password needs to be changed after first login and a new session opens.

To access to all the configurations and controls, it is necessary to open a session as admin or with a "Read/Write" user access account.

"Login Timeout (Sec)" set in the Configuration page closed automatically the session at the end of the time out..

More than one simultaneous session is not allowed.

If a session is still open, a new session will force logout of the previous session.

Password policy: minimum of 12 characters including:

- Upper case letters: A to Z
- Lower case letters: a to z
- Numbers: 0 to 9
- Special char: ! % # @ ^ * (other characters are not allowed)

13. INTERFACE MANAGEMENT

13.1. Configuration page

Upload Configuration	To upload configuration file.
Upload CA file	To upload certificate file.
Download Configuration	Stored the configuration file on local computer.
Download Root Certificate	Stored the self-generate certificate on local computer.
BootP/DHCP	Select Static or DHCP.
IP Address	xxx.xxx.xxx.xxx
Gateway Address	xxx.xxx.xxx.xxx
Subnet Mask	xxx.xxx.xxx.xxx
DNS Address	xxx.xxx.xxx.xxx
Admin Password	Change password.
Polling Rate (Sec)	This polling defines a frame sent to UPS/STS every xx s. It keeps the serial com port open. Polling rate set at 10s by default. Set to 0 stop sending this frame.
Serial Timeout (ms)	Time out of frame sent for COM port polling control.
Login Timeout (Sec)	Duration of a user session.
First Login Reset (Day)	Validity period of the password. Need to be changed after this period.
Baud Rate Setting	9600; 19200, 57600

13.2. Control page

Protocol	Port by default	Status	
BootP/DHCP		Disabled or Enabled	Disable for static IP
PING Echo		Disabled or Enabled	Disabled: ping not answering
Network Upgrade		Disabled or Enabled	Disabled: FW upgrade not allowed remotely
HTTPS	TCP 443	Disabled or Enabled	Enabled: Secure connection associated with the certificate
HTTP	TCP 80	Disabled or Enabled	Allow basic web connection
SSH Connection	TCP 22	Disabled or Enabled	Allow settings via hypertext console
Modbus Debug		Disabled or Enabled	Gives access to MODBUS frame log page

Action buttons:

- Reset to factory settings
- Reboot

13.3. MODBUS configuration

13.3.1. MODBUS TCP

Modbus TCP Configuration	Disabled or Enabled
Modbus Port	502
MODBUS TCP timeout (ms)	Max time waiting answer from device before transferring to TCP. Time over occurs an exception
Number of sessions opened	Indication of session open 1 to 3

13.3.2. MODBUS RS485 RTU

Modbus RTU Configuration	Disabled / Enabled
Slave Number	1 to 64
Baud Rate	2400, 4800, 9600, 19200, 38400, 57600
MODBUS RTU timeout (ms)	Max time waiting answer from device

No parity, 1 stop bit

13.4. Date and time

- Synchronize with computer
- NTP synchro
- Set manually

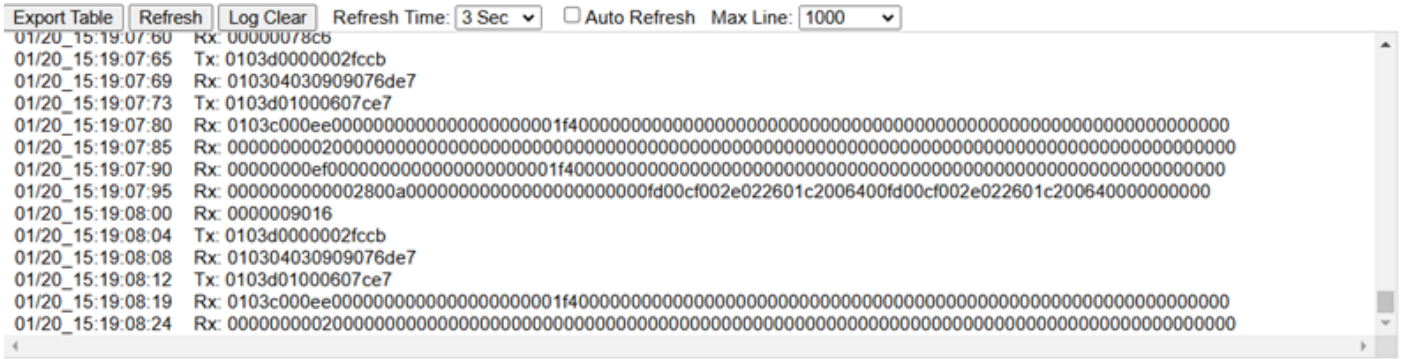
The date and time are set for event time stamp, NTP doesn't synchronized UPS or STS clock.

13.5. Firmware Upgrade

Select the bin file to upload for FW upgrade.

13.6. MODBUS debug

This page gives the possibility to analyse MODBUS frames between the interface and the UPS or STS



The content can be exported to CSV format.

Enabling for a while the debug mode can introduce trouble on TCP communication.

To enable this function for short check less than one minute is recommended. To disable after check or export.

13.7. Log file

13.7.1. List of interface events

UPS communication restored
UPS communication lost
RTU communication restored
RTU communication lost
TCP session x opened
TCP session x closed
Modbus Interface Agent Time changed by user
Modbus Interface Agent Time changed by server
admin Login success
Modbus TCP Timeout had changed
Serial Timeout had changed
Modbus Interface Agent Restart
Modbus Interface Agent Firmware upgrade
Poll rate had changed
Cold boot
Warm boot

13.7.2. Clear & save Log data

14. SSH TERMINAL SESSION

Via USB or Ethernet

```
Please press Enter to activate this console.
Please Enter User Name : admin
Please Enter Password: *************
                                                                  Date 29/11/2024
                                                                  Time 12:05:02

+=============================================================================+
|                   Modbus Interface Configuration Utility                    |
|                     [Socomec Modbus Interface v0.80 a3]                     |
+=============================================================================+
  1. Card Settings
  2. Reset Accounts/Passwords to Default
  3. Reset Configuration to Default
  4. Restart Card
  0. Exit

Please Enter Your Choice => 1
```

15. MODBUS RTU RS485

RS485 RJ45

Pin 7 = Rx/Tx (-)
Pin 8 = Rx/Tx (+)

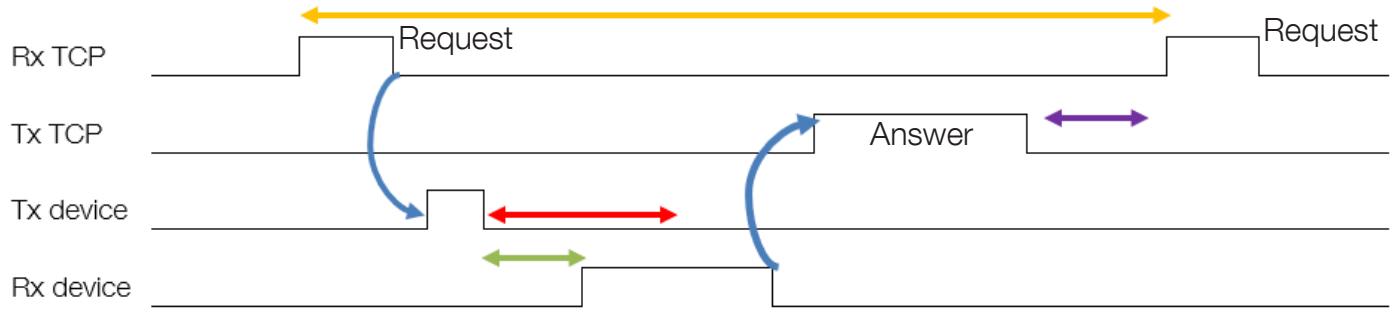
Terminal resistor: 120 Ω

Serial settings:

- Slave number range: 1 to 174
- Baud rate selection: 1200, 2400, 9800, 12900, 56700
- Parity fixed to none
- Stop bit fixed to 1

NOTE!
Use this serial link for point-to-point connection with 10 meters cable maximum.

16. MODBUS FRAME TIMING



Master polling time

MODBUS frame internal port transfer (Rx TCP → Tx device / Rx device → Tx TCP)

Device answer waiting timeout

Device answer time

Waiting time before next request from Master

NOTE!
The master must send the next request when last answer received and after waiting time.

Mode bus exception 0x0B sent on Tx (TCP) if

- Wrong MODBUS answer from device
- No answer from device – end of device timeout

Timeout optimizing estimation taking account:

- The baud rate between device and interface
- The max length of data requested
- The device answer time

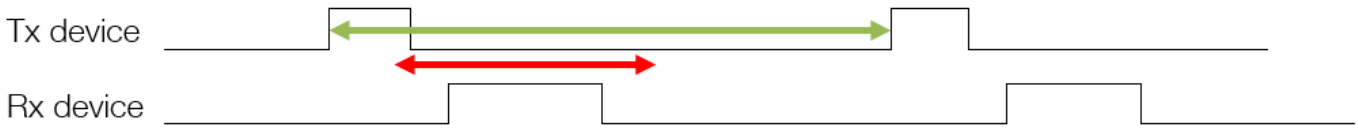
Time out set by default: 500ms

16.1. Serial port control polling

It keeps open the serial com port of UPS.

Polling rate: delay before sending the control frame: 30s means that this frame is sent every 30 seconds

Timeout: answer waiting time. If not response at the end of delay, the communication lost event stored in event log.



17. APPENDIX 1: NET VISION EXPLORER INSTALLATION

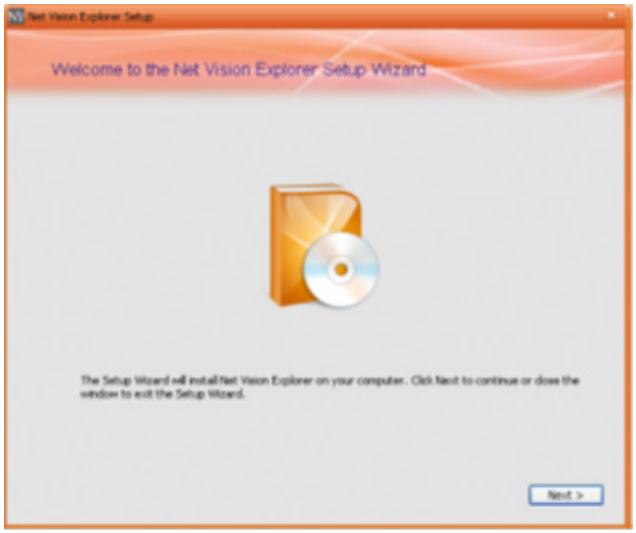
To get NET VISION Explorer, download it from the SOCOMEC website:
https://socomec.co.uk/en-gb/net-vision-8-ups-websnmp-ethernet-card-iot-gateway

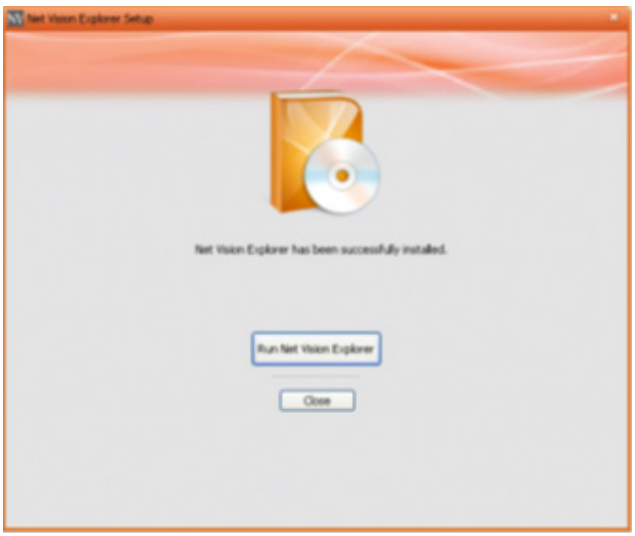
Admin rights are necessary to install the NET VISION Explorer programme.

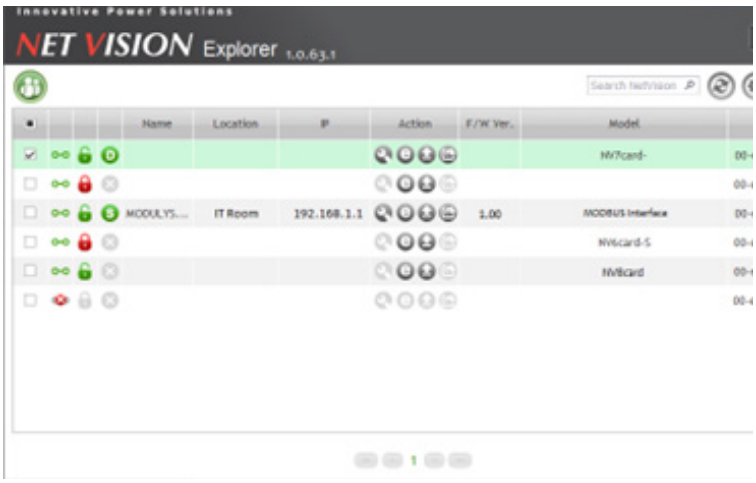
Run the NET VISION Explorer.exe file

Follow the installation instructions.

The programme is installed by default to \Program Files\SOCOMEC







18. APPENDIX2 : TECHNICAL INFORMATION

LED Definition

EMD and Network LEDs indicate the operating status of the interface as following:

Port	Green LED	Yellow LED	Description
Network	ON	OFF	Ethernet 1000 Traffic
	OFF	ON	Ethernet 100 Traffic
	OFF	OFF	Ethernet Disconnection
RS485	OFF	Flashing	Device detection
	ON	OFF	Device detected, no com with device
	ON	Flashing	Communication with device
	Flashing	Flashing	Power ON
	ON	ON	Communication Failed
	OFF	OFF	Hardware Error

Technical specification

Function	Description
Power Input	+7.5V ~ 40V
Power Consumption	3.0 Watts Maximum
SMT Switch	SMT switch on the board for configuration
Dimensions (L x W x H mm)	129.9(L) x 60.0(W) mm
Operating Temperature	-20 ~ 70° C
Operating Humidity	10 ~ 80 % (non-condensing)

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