Anybus® BY HMS NETWORKS

Enabling and Using OPC UA

Communicator IIoT

APPLICATION NOTE

SCM-1202-127 1.0 en-US ENGLISH

HMS Connecting Devices™

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1 Preface

This document describes how to setup and configure an Anybus Communicator IIoT device to enable OPC UA and how to connect and use the desktop client UaExpert.

More documentation and downloads can be found at www.anybus.com/support. For more info regarding OPC UA and UaExpert, please visit the manufacturer's support website.

1.1 Document History

Version	Date	Description
1.0	2019-03-08	First release

1.2 Document Conventions

Ordered lists are used for instructions that must be carried out in sequence:

1. First do this
2. Then do this

Unordered (bulleted) lists are used for:

- Itemized information
- Instructions that can be carried out in any order

...and for action-result type instructions:

► This action...

→ leads to this result

Bold typeface indicates interactive parts such as connectors and switches on the hardware, or menus and buttons in a graphical user interface.

```
Monospaced text is used to indicate program code and other
kinds of data input/output such as configuration scripts.
```

This is a cross-reference within this document: *Document Conventions, p. 3*

This is an external link (URL): www.hms-networks.com

This is additional information which may facilitate installation and/or operation.

This instruction must be followed to avoid a risk of reduced functionality and/or damage to the equipment, or to avoid a network security risk.

Caution
This instruction must be followed to avoid a risk of personal injury.

WARNING
This instruction must be followed to avoid a risk of death or serious injury.

2 Setup and Configuration

2.1 Prerequisites

- Download and install UaExpert from Unified Automation: www.unified-automation.com/products/development-tools/uaexpert.html
- Download and install an OPC UA Discovery server on a PC that the Anybus Communicator IIoT can access to get time synchronized.
  - Local discovery server from OPC Foundation: opcfoundation.org/developer-tools/developer-kits-unified-architecture/local-discovery-server-lds/. This server installs as a service on a Windows PC and needs no configuration. It is, however, required to get a correct timestamp.
- An Anybus Communicator IIoT device supporting OPC UA, configured according to the startup guide.

2.2 Configuration

When opening the local web page of the IIoT interface, an OPC UA configuration section shall be present. It is possible to specify what port the OPC UA server of the Communicator IIoT listens to and the URL to the Discovery server to be accessed to get time synchronized.

Configure the Discovery Server URL to point to the PC where the Discovery Server is installed. The format of the URL must be: `opc.tcp://<ip address or hostname>:<port>`. The port is optional. If it is absent, the default port 4840 will be used.

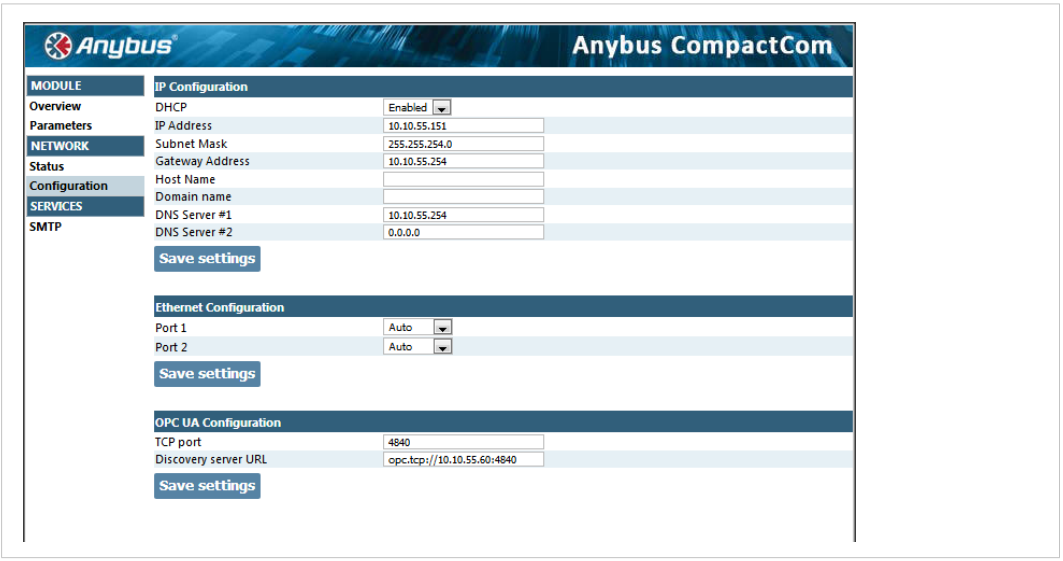

Fig. 1

> **!** To get values timestamped correctly and to get valid timestamps in the responses from the Communicator IIoT, a valid Discovery Server URL must be configured.

The configuration file has the same format as configuration files for web and FTP access. The opcua.cfg file can itself contain a set of user/password pairs or point out other user/password files in the filesystem. By pointing out one or several files with username and passwords it is possible to share configured users between OPC UA, web, and FTP.

3 Use UaExpert

3.1 Connect to the Anybus Communicator IIoT

When starting UaExpert a new project will be loaded automatically. To add the Communicator IIoT to the project, right click on the Servers folder of the Project window. Select “Add…” in the drop-down menu.

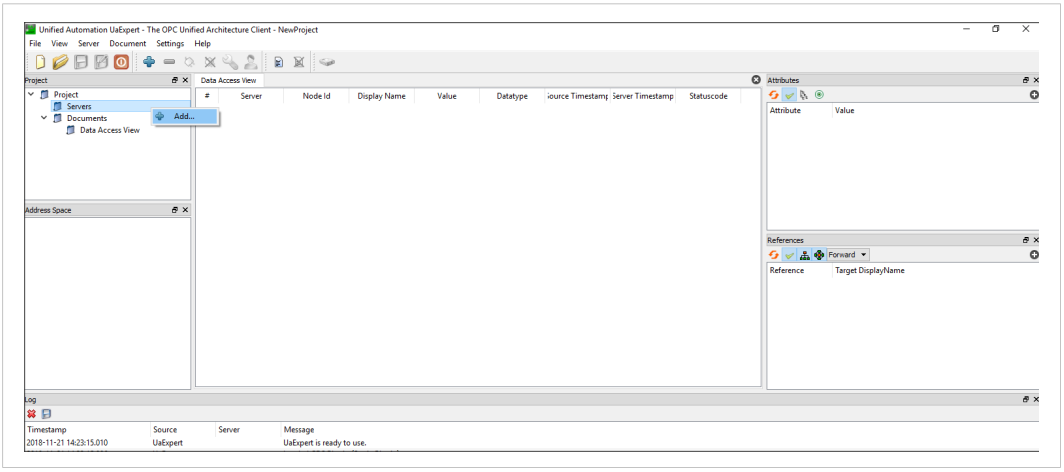

Fig. 2

A new dialog window, “Add Server”, shall pop up. On the Discovery tab, add the Communicator IIoT device in the Custom Discovery section by double clicking on the “Double click to Add Server…” option.

Enter the IP address of the device in the format `opc.tcp://<ip-address or hostname>:<port>`, e.g. `opc.tcp://192.168.0.10`. If no port is specified, UaExpert will use the default TCP port 4840.

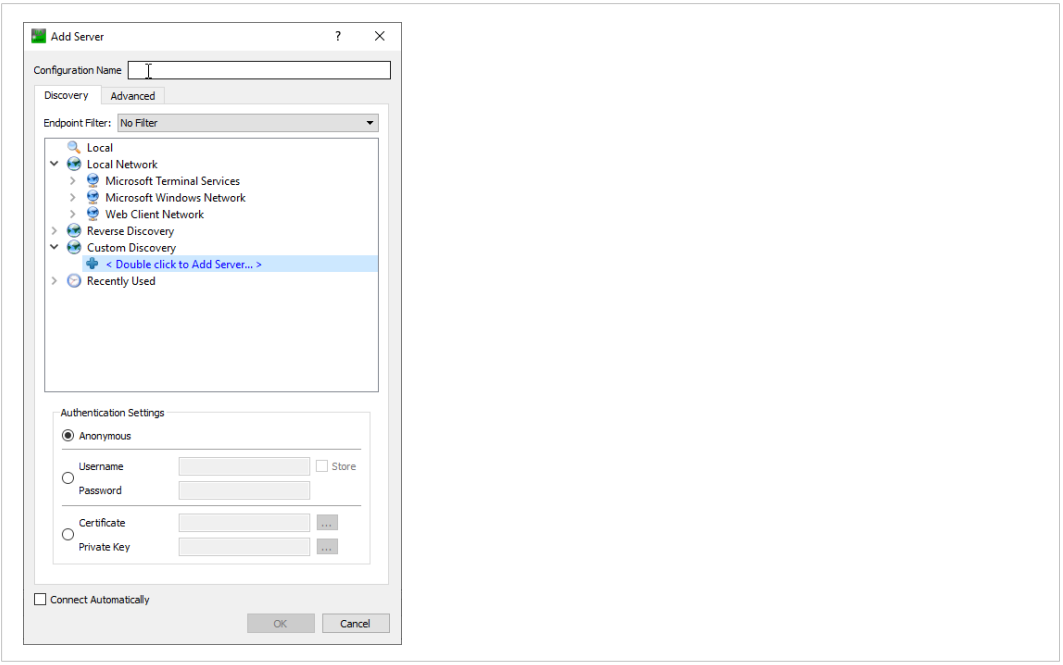

Fig. 3

When the device has been added, expand it to find the available OPC UA server on the device. Then expand the OPC UA server to see available endpoints to connect to. As the Anybus Communicator IIoT does not support any security options there is only one unsecured endpoint

available. If authentication is desired, there is an option to add a file with authentication settings (username and password) via FTP. See the manual for more information.

Press the OK button to confirm the addition of the Communicator IIoT device to the UaExpert project.

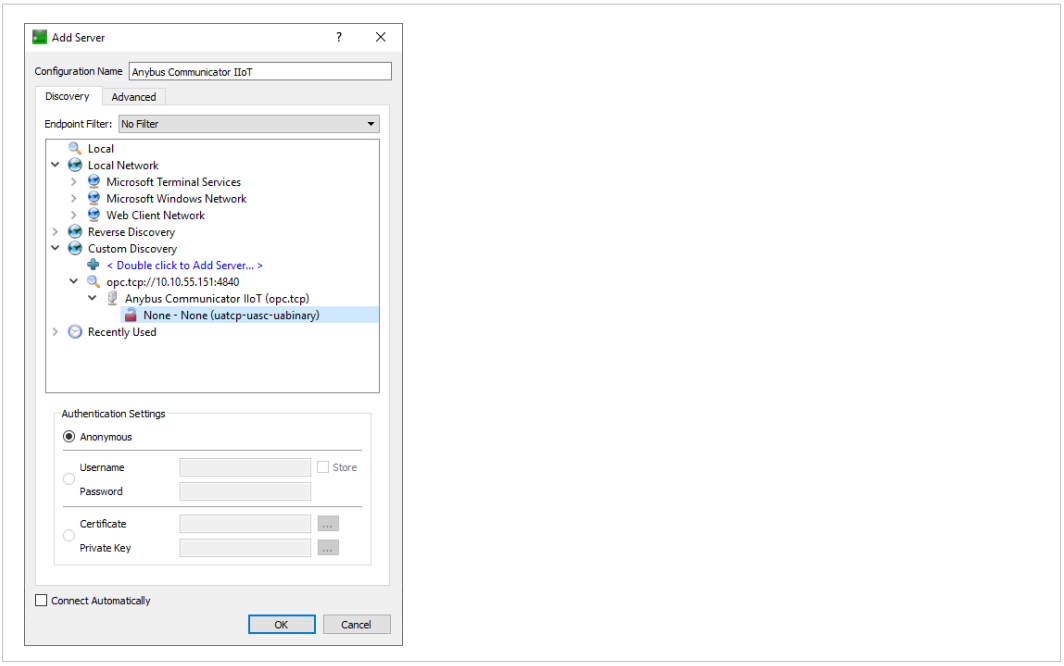

Fig. 4

When the Communicator IIoT device has been added to the UaExpert project, it is possible to right click on the entry representing the device in the Servers folder of the project view. Click on the “Connect” option in the drop-down menu to connect to the device.

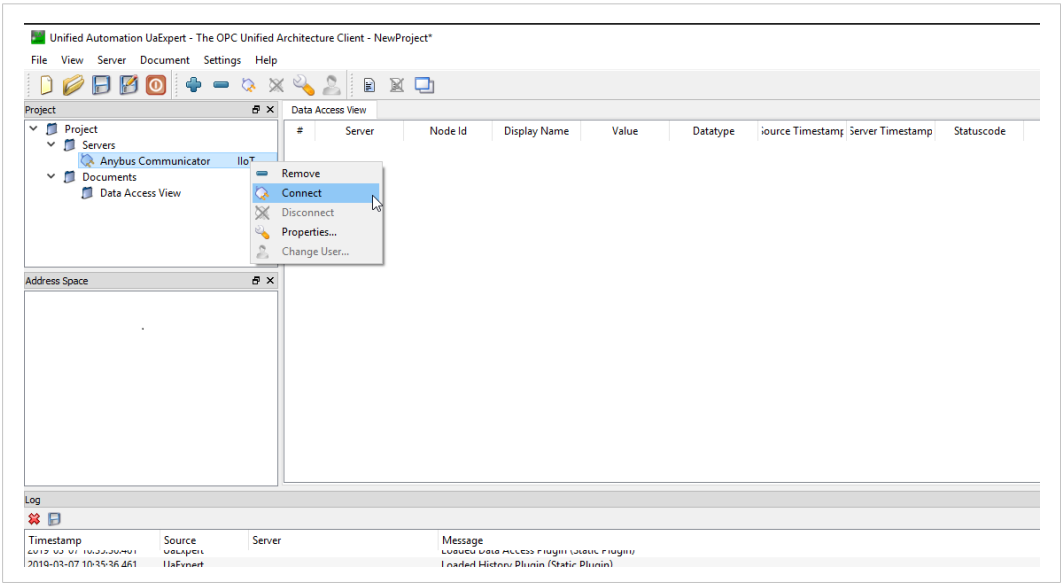

Fig. 5

3.2 Browse the Address Space

Once connected, UaExpert will present the Address space of the device in the Address Space window (1). The address space can be browsed manually by expanding the folders and objects visible in the Address Space window. At the bottom UaExpert presents a log of events (2). If it fails to connect to the device or the Address Space is not populated as expected, it is recommended to take a look at this log to figure out the problem.

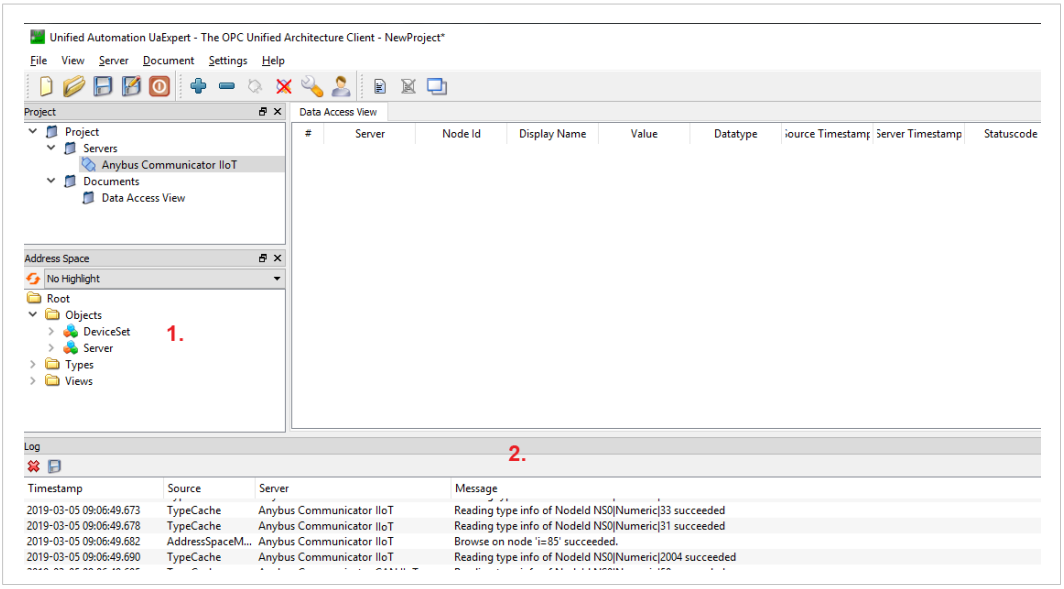

Fig. 6

When browsing the address space, it is possible to select any node to get more details about it. When a node has been selected in the Address Space window, all attributes of the node are presented in the Attributes window (1). All nodes always have a mandatory base set of attributes, then different node classes may specify additional attributes as well, both mandatory and optional ones.

The references of the selected node are presented in the References window (2). By default only forward references are shown. But there is a drop-down list that offers the possibility to show inverted references or references in both directions.

The Address Space window, the Attributes window and the References window also have a refresh button which forces UaExpert to reload the information presented in the window by requesting it from the device.

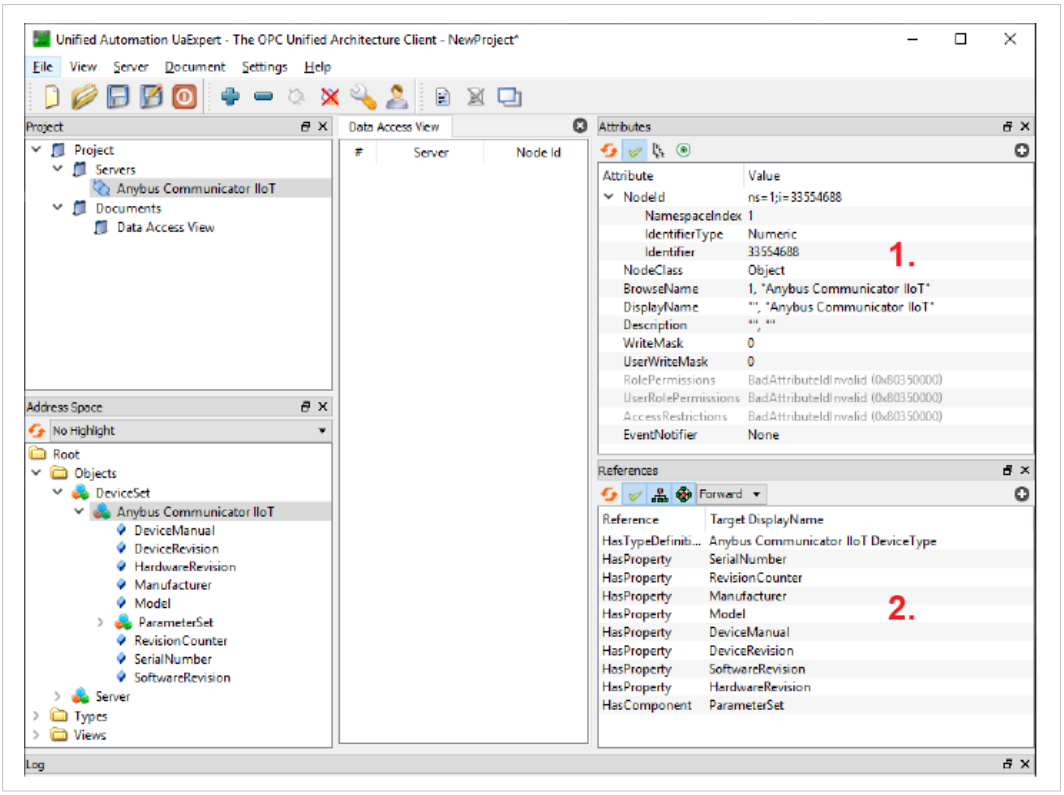

Fig. 7

3.3 Subscribe to Monitor the Configured Tags

The configured tags are present in the ParameterSet of the device in the address space. By selecting the node it is possible to see the current value of the tag in the Attributes window.

To setup a subscription and monitor the value of a tag, drag and drop one of the variable nodes from the ParameterSet into the Data Access View tab. UaExpert will display the current value of the parameter, its data type, timestamp when latest value was received etc. The OPC UA implementation in the Communicator IIoT has support for 80 tags. To access all 80 tags, you need to configure two client connections toward the Communicator IIoT. Each client connection will use two subscriptions and each subscription supports 20 tags.

UAExpert will only create one subscription per client connection, leaving you with a total maximum of 20 tags per client connection.

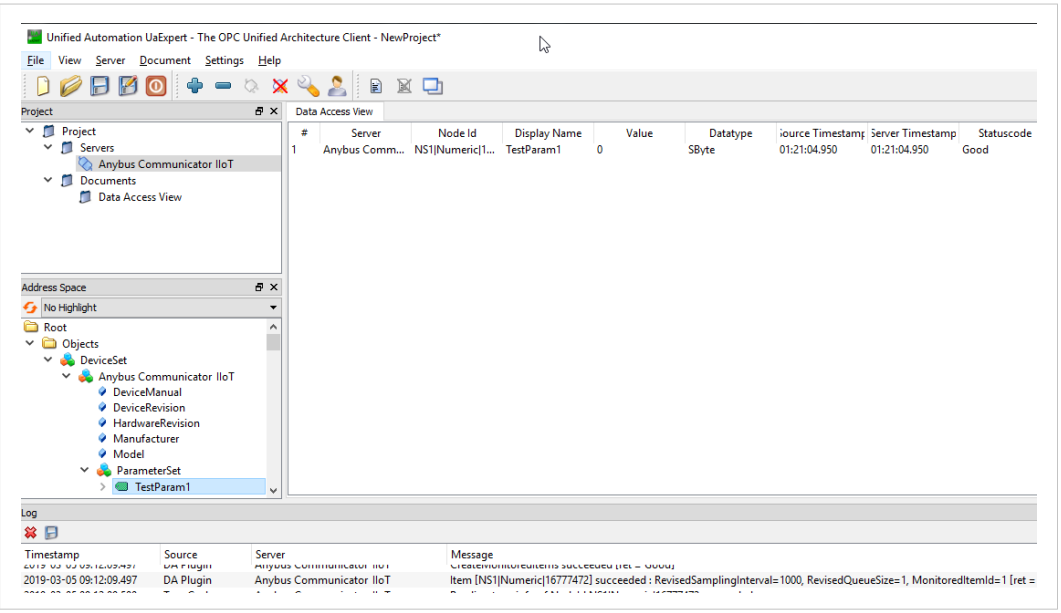

Fig. 8

3.4 UaExpert Devices View

UaExpert also has a specific view to display the information about an OPC UA device. To show this information, follow these steps:

1. Right-click Documents.
2. Choose Add.
3. Find Devices View in the list.
4. Double-click Communicator IIoT.

Note that to display this view, UaExpert needs to load a lot of information from the Communicator IIoT. It therefore takes some time for UaExpert to load all data before this view is presented.

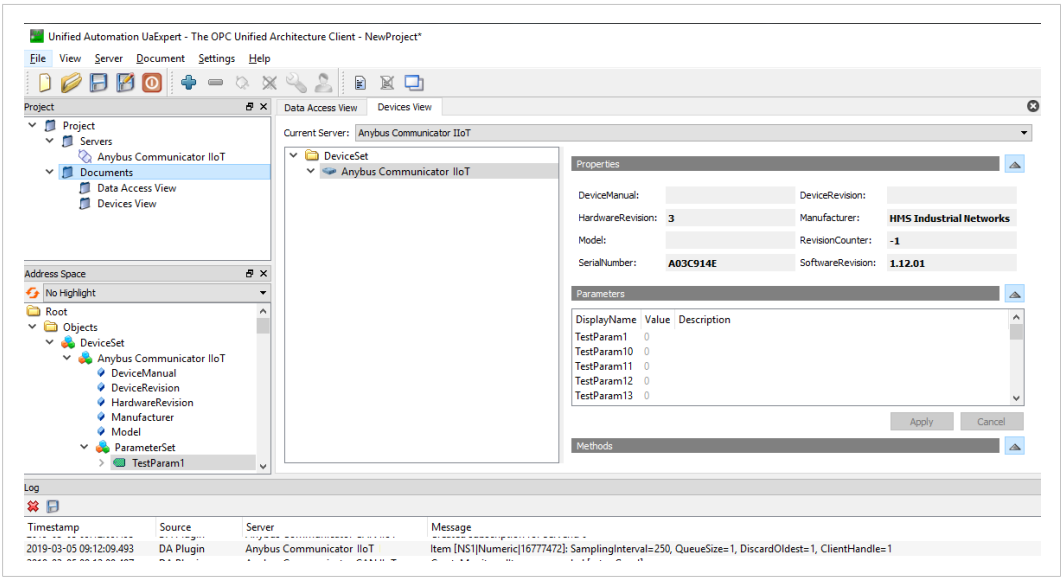

Fig. 9

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