



# KNXnet/IP

*RTI XP Series Controllers*

*KNXnet/IP Driver*

**Driver Guide**

**Version 3.0.0.1**

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## 1 Overview

The Active Surroundings KNXIP/Net driver version 3 for RTI XP Series controllers allows the RTI programmer to command KNX objects using any KNXIP/Net gateway which supports the KNXIP/net tunneling protocol.

This full 2 way driver has easy to use features that permit the switching and dimming of lights, the controlling of shutters, curtains blinds etc., and the control of climate control set points. The driver includes the free address sending of telegrams, supports the most common data types required for most control operations and supports the ability to call system macros when specific telegrams are received or when a specified logical condition exists.

The driver is provided with a sample project with many of the features implemented, to facilitate learning the steps required for successful integration.

## 2 Driver Version

The Active Surroundings KNXIP/Net driver version 3 contains many internal and interface changes from previous versions and is NOT backwardly compatible with previous projects containing previous driver versions. Such projects therefore cannot be upgraded to this driver. License keys for previous versions will not unlock the version 3 driver. This version of the driver represents a new product.

## 3 Supported IP Gateway Types

The Active Surroundings KNXIP/Net driver uses the KNXIP/Net UDP tunneling protocol. All IP gateway devices compliant with ETS3 KNX programming software will work with this driver, which should include almost all KNX IP gateways.

## 4 Supported KNX data types

Version 3.0.0.1 of this driver supports transmission and reception of the following KNX data types;

- 1 Bit – KNX data type 1.\*
- 4 Bit – KNX data type 3.\*
- 6 Bit – KNX data type 3.\*
- 1 Byte – KNX data type 5.\* unsigned
- 1 Byte – KNX data type 6.\* signed
- 2 Byte – KNX data type 7.\* unsigned
- 2 Byte – KNX data type 8.\* signed
- 2 Byte – KNX data type 9.001 temperature
- 3 Byte – KNX data type 10.001 time
- 3 Byte – KNX data type 11.001 date
- 14 Byte – KNX data type 16.\* ASCII

## 5 Sample Project

The driver is provided with a sample project configured to demonstrate some of the various ways the driver may be integrated into an RTI project.

Before you upload the sample project to your controller for testing, you will need to ensure the KNX Driver is configured to the IP address of your IP gateway (see driver configuration).

## 6 Driver Configuration

Below is a list of and explanations for the configurable properties of the driver. These must be correctly completed for the driver to function correctly.

### 6.1 KNX Communications

**Gateway IP Address:** The IP address of your KNX IP gateway.

**Port:** KNX standard default port is 3671, change only if the gateway is set for a non-standard port.

### 6.2 Incoming Telegrams (UDP)

**Allow incoming UDP telegrams:** Specifies if the driver will accept UDP telegrams received from an external source, such as another driver or device.

**Port:** Default 4001, the port the driver will listen for external telegrams.

### 6.3 Outgoing Telegrams (UDP)

**Allow outgoing telegrams:** Specifies if the driver will relay telegrams received from the bus to the UDP endpoint specified.

**IP Address:** IP address the driver should relay the telegram text to.

**Port:** The port the end point device is listening on.

## 6.4 Poll Settings

From time to time, an RTI XP controller may be restarted. This may be due to power outage, project update or hardware replacement. It is important that we can balance the state of the control panel (lighting state, set point values, thermostat values etc.) with the devices on the KNX bus, for this reason we may want to read or poll each group to determine the current state or value. It is possible to define which groups are included in the polling list.

**Polling Mode:** Specifies if polling is enabled and when. Possible options include;

*“No polling for values”* – no polling will occur.

*“One time on startup only”* – Groups in the polling list will be polled once, when the XP is started and once the connection to the IP gateway is established.

*“Continual Loop”* - Groups in the polling list will be sequentially polled. When the last item in the polling list has been completed, polling will resume from the start of the polling list in a cyclic manner.

**Telegram Frequency (MS):** The number of milliseconds between each polling request. The optimum value depends on several factors whose variable nature will be related to RTI project and KNX system nature.

**Poll Lighting Groups (Status):** Specifies that the status group in each defined lighting item is to be included in the polling list.

**Poll Brightness Values (Status):** Specifies that the brightness value group in each defined lighting item is to be included in the polling list.

**Poll Macro Trigger Groups:** Specifies that each defined trigger group item is to be included in the polling list.

**Poll Data Table:** Specifies that each defined group in the data table is to be included in the polling list.

## 6.5 Lighting Groups

In this section we define our switches and dimmers. Using this section allows us to implement the various built in lighting mechanisms such as dimming sliders, dimming buttons and toggle switches.

Each item in the lighting section contains several items:

**Group – Name (Optional):** You may enter the name of the group. This may be used for either your own use in clarifying the groups use, or for display purposes by using the Lighting Name variable.

**Group – Switch - Activation:** The activation group address for the switch.

**Group – Switch – Status (Optional):** The status group address for the switch.

**Group – Dim (Optional):** The dim stepping group.

**Group – Brightness Value – Set (Optional):** The group for setting brightness value.

**Group – Brightness Value - Status (Optional):** The groups for receiving the brightness value, if different from the above group.

## 6.6 Shutters/Blinds Curtains groups

This section allows the definition of groups for KNX move commands, move and stop.

Each item in this section contains the properties below:

**Group – Name (Optional):** You may enter the name of the group. This may be used for either your own use in clarifying the groups use, or for display purposes by using the corresponding name variable.

**Group – Move:** The group address definition for move.

**Group – Stop:** The group address definition for stop.

## 6.7 Macro Trigger Groups

This section defines which groups will trigger the calling of RTI system macros. The triggers permit a single value or logical expression.

Each item in this section contains the properties below:

**Group – Name (Optional):** You may enter the name of the group. This may be used for clarifying the groups' use. There are no corresponding display variables for this item.

**Groups – Address:** The group activating the macro.

**Group - Trigger Value:** The value or expression to watch for.

**Group – Macro ID:** The ID of the macro to call.

### Example 1 – Using a value;

Address: 10/1/1

Trigger Value: 10

Macro ID:1

When telegram 10/1/1=10 is received, macro 1 will be called.

### Example 2 – Using an expression;

“value” is a reference to the current value for the specified group address. There are 512 items in the trigger groups, so the “value[1]” would be used to reference the first in the list, “value[5]” would reference the 5th item, and so on.

Address: 10/1/1

Trigger Value: value[1] < 50

Macro ID:1

When telegram 10/1/1=20 is received, macro 1 will be called.

When telegram 10/1/1=10 is received, macro 1 will be called.

When telegram 10/1/1=51 is received, macro 1 will NOT be called.

### Example 3 – Using an expression;

Address: 10/1/1

Trigger Value: value[1] < 50 && value[1] > 40

Macro ID:1



The macro will be called when 10/1/1 has a value of 41-49.

#### **Example 4 – Using an expression;**

Address: 10/1/1

Trigger Value: value[1] >=10 && value[2] >=10

Macro ID:1

The macro will be called when ;

10/1/1 is received from the bus AND the first defined group in the triggers list has been received with a value >= 10 AND the second defined group in the triggers list has a been received with a value >= 10.

The list of operators below are supported when specifying an expression:

&& and

|| or

== equal to

< less than

> greater than

>= equals or greater than

<= equals or less than

## **6.8 Data Type Table**

All KNX telegrams contain data. Sometimes the data could be interpreted in different ways. An example of this is a 1 byte telegram containing the value FF (hex). This could be interpreted as 255 or -1 depending on the intention of the point of origin. Another example would be a 3 byte telegram containing data 8E 11 2C. This data could be “Thursday 14:17:44” if it were to be interpreted as a time or “2044-01-14” if it were interpreted as a date.

The Data Type Table allows specified addresses to be pre-defined as a specific type so that when a telegram is received from the specified address, the data will be correctly interpreted.

**Note:** The data table definition may be overridden by the driver if a telegram is received from the KNX with an unambiguous value attached. For example, if 10/2/2 is defined in the data table as 2

bytes but a telegram is received 10/2/2=0 as a 1 bit telegram, then the 2 byte definition in the data table is ignored.

**Important note:** If an ambiguous value is received from the KNX bus from a group address NOT specified in the data table, then the raw byte value will be output by the driver, an example would be a 3 byte value, which could be or a date or a time might be output like 11/1/4=0C 4C 22.

Each item in the data table section contains the properties below:

**Group – Name (Optional):** You may enter the name of the group. This may be used for either your own use in clarifying the groups use, or for display purposes by using the Name variable.

**Group – Address:** Group address

**Group – Data Type:** A drop down list containing a list of all the data types supported in the current version.

## 6.9 Advanced Settings

**DPT Localization:** A drop down list of all currently supported languages used in textual output. Days of the week are an example.

**Format 2 Byte 9.001 temperature:** A drop down list with a choice or temperature text formats.

## 6.10 Keys

**Support Key:** Reserved for future use.

**License Key:** Location in which to paste your purchased license key.

## 7 Driver Commands

### 7.1 Lights

#### 7.1.1 Switch On

Description:

Sends a 1 bit on command to the light group specified in the parameter. This command is useful for “on only” buttons.

Parameters:

*Address Number* (Number) specifies which lighting group in the groups list to use, the number 1 would specify the first group in the list.

#### 7.1.2 Switch Off

Description:

Sends a 1 bit off command to the light group specified in the parameter. This command is useful for “off only” buttons.

Parameters:

*Address Number* (Number) specifies which lighting group in the groups list to use, the number 1 would specify the first group in the list.

#### 7.1.3 Toggle Switch

Description:

Sends the Boolean opposite to the current switch value to the light group specified in the parameter. The command is generally used when using iPad style toggle switches.

Parameters:

*Address Number* (Number) specifies which lighting group in the groups list to use, the number 1 would specify the first group in the list.

#### 7.1.4 Press Button

##### Description:

Sets a key press state associated with the light group specified in the parameter. This command is used in a macro as part of the single button on/off dimmer functionality.

##### Parameters:

*Address Number* (Number) specifies which lighting group in the groups list to use, the number 1 would specify the first group in the list.

#### 7.1.5 Release Button

##### Description:

Sets a key release state associated with the light group specified in the parameter. This command is used in a macro as part of the single button on/off dimmer functionality.

##### Parameters:

*Address Number* (Number) specifies which lighting group in the groups list to use, the number 1 would specify the first group in the list.

#### 7.1.6 Set Brightness

##### Description:

Sends the specified brightness level to the specified address number.

##### Parameters:

*Address Number* (Number) specifies which lighting group in the groups list to use, the number 1 would specify the first group in the list.

*Level* (number) specifies the brightness value to set. Values are according to the actuator, but from 0 to 255.

#### 7.1.7 Set Brightness Slider

##### Description:

Alternate version to the "Set Brightness" command above. Intended for use with iPad sliders only.

##### Parameters:

*Address Number* (Number) specifies which lighting group in the groups list to use, the number 1 would specify the first group in the list.

## 7.2 Shutters Blinds Curtains

### 7.2.1 Move

**Description:**

Performs the specified move operation on the specified move address.

**Parameters:**

*Address Number* (Number) specifies which move group in the groups list to use, the number 1 would specify the first group in the list.

*Operation* (List) List options are “Up/Open”; “Down/Close”; “Stop”.

## 7.3 General

### 7.3.1 Send Telegram

**Description:**

Sends a telegram to the KNX bus.

**Parameters:**

*Operation* (List) List items are “Write” and “Read”. Specifies whether the telegram is of read or write type.

*Group* (Text) Group address in the format main/mid/address. The telegram format is main/mid/address (e.g.: 0/1/1).

*Value* (Text) Applicable for write operations only, this parameter specifies the value to send to the specified group address.

*Data Type* (List) The list provides the choice of all supported data types, the correct type must be specified for the telegram to succeed.

### 7.3.2 Send Value

Description:

Sends a value to one of the groups listed in the data table.

Parameters:

*Data Table Address number* (Number) specifies which move group in the groups list to use, the number 1 would specify the first group in the list.

*Value* (Text) Specifies the value to be sent to the group.

*Upper Limit* (Number) optional, when applicable, this parameter will set an upper numeric limit to any data being sent. An example of this may be climate control set points which would require an upper limit of 32°C for example.

*Lower Limit* (Number) optional, when applicable, this parameter will set an lower numeric limit to any data being sent. An example of this may be climate control set points which would require a lower limit of 16°C for example.

## 8 Driver Variables

### 8.1 Lighting Names

*Address 1 Name*: Used for display of the corresponding group address name created in the group configuration.

### 8.2 Lighting Values

*Address 1 Switch Status*: Used to display the on/off state of a lighting groups.

*Address 1 Brightness Value*: Used for the display of, or the slider placement position representing, the current brightness value of a dimmer.

### **8.3 Move Names**

Move 1 Name: Used to display the name of the move group, as specified in the group configuration.

### **8.4 Data Table Item Names**

Data Table Item 1 – Name: Used to display the name of the group, as specified in the group configuration.

### **8.5 Data Table Item Values**

Data Table Item 1 – Value: Contains the value of the last received telegram from the specified group.