

# Description of the Smart Grasping example program

## Main Routine:

NW0: Calling the "INIT" subroutine

The controller's "First Scan" command starts an initialization run. This process enters data into a structure that is used to establish and monitor an open connection between the controller and the Smart Grasp.

Timeout = time after which a connection failure is reported

DestAddr = IP address and port to which the controller should connect.

NW1: Starting the connection between the controller and Smart Grasp

Setting the bit that starts the connect

NW2: Stop the connection between the controller and Smart Grasp

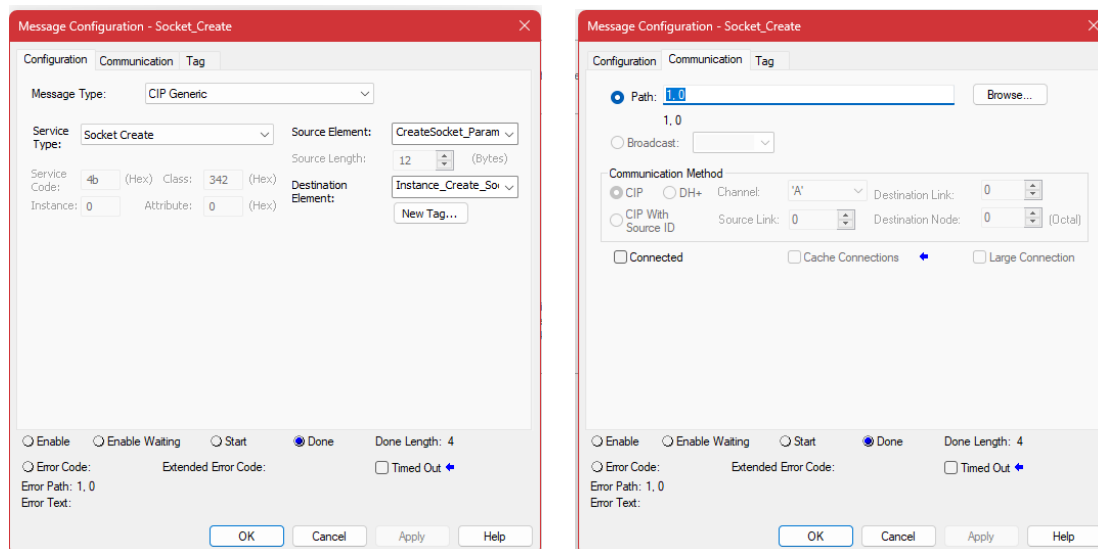
reset the bit that starts the connect

NW3: When the connection is started, a timer is started.

NW4: Set the bit to start reading in NW12

NW5: Push to open a socket connection using a message box

The message box is set up as follows.



Timer to maintain the connection to the Smart Grasping Box.  
The time is always set in milliseconds.

Nw6: Opening the connection between Smart Grasping and the controller

The length of the MSG source element should be 8 bytes + the number of characters in the address (i.e. for the address 192.168.1.101?port=42001 it would be 8+24=32).

8 is the offset in the struct 2 x 4 bytes = 8 bytes offset

The 'Message Configuration - Open\_Connection' dialog box, Configuration tab, shows the following settings:

- Message Type: CIP Generic
- Service Type: OpenConnection
- Source Element: SVC\_Params
- Source Length: 32 (Bytes)
- Service Code: 4c (Hex) Class: 342 (Hex)
- Destination Element: (empty)
- Instance: 27986 Attribute: 0 (Hex)
- Buttons: New Tag...
- Bottom section: ☐ Enable, ☐ Enable Waiting, ☐ Start, ☒ Done, Done Length: 0. ☐ Error Code: Extended Error Code: ☐ Timed Out +. Error Path: 1, 0 Error Text: (empty).
- Buttons: OK, Cancel, Apply, Help.

The 'Message Configuration - Open\_Connection' dialog box, Communication tab, shows the following settings:

- Path: 1, 0 (with a Browse... button)
- Broadcast: (empty)
- Communication Method: ☒ CIP, ☐ DH+ Channel: 'A' Destination Link: 0
- ☐ CIP With Source ID Source Link: 0 Destination Node: 0 (Octal)
- ☐ Connected ☐ Cache Connections + ☐ Large Connection
- Bottom section: ☐ Enable, ☐ Enable Waiting, ☐ Start, ☒ Done, Done Length: 0. ☐ Error Code: Extended Error Code: ☐ Timed Out +. Error Path: 1, 0 Error Text: (empty).
- Buttons: OK, Cancel, Apply, Help.

NW7: Close the connection between Smart Grasping and the controller.

The 'Message Configuration - Close\_Sockets' dialog box, Configuration tab, shows the following settings:

- Message Type: CIP Generic
- Service Type: Custom
- Source Element: (empty)
- Source Length: 0 (Bytes)
- Service Code: 51 (Hex) Class: 342 (Hex)
- Destination Element: (empty)
- Instance: 0 Attribute: 0 (Hex)
- Buttons: New Tag...
- Bottom section: ☐ Enable, ☐ Enable Waiting, ☐ Start, ☒ Done, Done Length: 0. ☐ Error Code: Extended Error Code: ☐ Timed Out +. Error Path: 1, 0 Error Text: (empty).
- Buttons: OK, Cancel, Apply, Help.

The 'Message Configuration - Close\_Sockets' dialog box, Communication tab, shows the following settings:

- Path: 1, 0 (with a Browse... button)
- Broadcast: (empty)
- Communication Method: ☒ CIP, ☐ DH+ Channel: 'A' Destination Link: 0
- ☐ CIP With Source ID Source Link: 0 Destination Node: 0 (Octal)
- ☐ Connected ☐ Cache Connections + ☐ Large Connection
- Bottom section: ☐ Enable, ☐ Enable Waiting, ☐ Start, ☒ Done, Done Length: 0. ☐ Error Code: Extended Error Code: ☐ Timed Out +. Error Path: 1, 0 Error Text: (empty).
- Buttons: OK, Cancel, Apply, Help.

Message box settings.

NW8: ADD-On Instruction is executed.

## NW9: Send data to Smart Grasping Box

The data frame has a length of 80 bytes. The header of 16 bytes is added together to determine the length of the data frame to be written.

Message Configuration - Write\_MSG

Configuration Communication Tag

Message Type: CIP Generic

Service Type: WriteSocket Source Element: Data\_Source\_Write

Service Code: 4e (Hex) Class: 342 (Hex) Source Length: 96 (Bytes)

Instance: 27986 Attribute: 0 Destination Element: Data\_Response\_Write

New Tag...

Enable Enable Waiting Start Done Done Length: 4

Error Code: Extended Error Code: Timed Out

Error Path: 1, 0 Error Text:

OK Cancel Apply Help

Message Configuration - Write\_MSG

Configuration Communication Tag

Path: 1, 0 Browse...

Broadcast:

Communication Method

CIP DH+ Channel: 'A' Destination Link: 0

CIP With Source ID Source Link: 0 Destination Node: 0 (Total)

Connected Cache Connections Large Connection

Enable Enable Waiting Start Done Done Length: 4

Error Code: Extended Error Code: Timed Out

Error Path: 1, 0 Error Text:

OK Cancel Apply Help

Message box settings.

NW10: Time to keep the “Read Data” signal pending for 500 ms.

NW11: Edge after the time from NW10 has elapsed to automatically clear the “Read Data” signal

NW12: Data reading with a message box

Message Configuration - Read\_Socket

Configuration Communication Tag

Message Type: CIP Generic

Service Type: ReadSocket Source Element: Read\_Data\_Req

Service Code: 4d (Hex) Class: 342 (Hex) Source Length: 8 (Bytes)

Instance: 27986 Attribute: 0 Destination Element: Data\_Response\_Read

New Tag...

Enable Enable Waiting Start Done Done Length: 92

Error Code: Extended Error Code: Timed Out

Error Path: 1, 0 Error Text:

OK Cancel Apply Help

Message Configuration - Read\_Socket

Configuration Communication Tag

Path: 1, 0 Browse...

Broadcast:

Communication Method

CIP DH+ Channel: 'A' Destination Link: 0

CIP With Source ID Source Link: 0 Destination Node: 0 (Total)

Connected Cache Connections Large Connection

Enable Enable Waiting Start Done Done Length: 92

Error Code: Extended Error Code: Timed Out

Error Path: 1, 0 Error Text:

OK Cancel Apply Help

Message box settings.

NW13: Reset the outputs

NW14: Check whether data has arrived in the data block and output that the data transfer is OK.

## Subroutines

### INIT:

This subroutine contains a timer that is used to monitor for a connection loss between the controller and the Grasping Kit. It also specifies the IP address with which the Grasping Kit communicates.

### Panel:

This subroutine contains input and output data. These can be used by HMIs from various manufacturers to control the example program.

### Request\_Response:

This subroutine contains an erasure matrix which is used at the required time to delete old data.