

MODBUS_READ_COILS_FC01				Support		
This command performs the Modbus Function Code 01(FC01) operation. (Socket Command UDFB)				Communicate with the Modbus TCP Server.		
Function block						
<div><div><div>BOOL</div><div>Execute Done</div><div>BOOL</div></div><div><div>USINT</div><div>Channel Busy</div><div>BOOL</div></div><div><div>UINT</div><div>TimeOut Error</div><div>BOOL</div></div><div><div>USINT</div><div>UnitID Error String</div><div>STRING</div></div><div><div>WORD</div><div>Transaction Coils</div><div>ARRAY[2000] OF BOOL</div></div><div><div>UINT</div><div>Address</div><div></div></div><div><div>UINT</div><div>QtyCoils</div><div></div></div></div>						
I/O	Type	Variable	Content	Scope	Unit	Defalut
Input	BOOL	Execute	Operating on the rising edge.	TRUE, FALSE	-	FALSE
	USINT	Channel	Input socket command channel for operation. (limited to the channel connected to the Modbus TCP server)	1~8	-	0
	UINT	TimeOut	Maximum response waiting time in sec. (0: unlimited waiting time.)	0~65535	Sec	0
	USINT	UnitID	Identification of a remote slave connected on a serial line or on other buses.	0~255	-	0
	WORD	Transaction	Transection number of Modbus frame.	16#0 to16#FFFF	-	0
	UINT	Address	Address for the coil to be read.	0 to 65535	-	0
	UINT	QtyCoils	The quantity of coils to be	0 to 2000	-	0

			read.			
Output	BOOL	Done	Execution complete state.	TRUE, FALSE	-	-
	BOOL	Busy	Executing state.	TRUE, FALSE	-	-
	BOOL	Error	Error state.	TRUE, FALSE	-	-
	STRING	ErrorString	Details for error.	-	-	-
	ARRAY[2000] OF BOOL	Coils	Memory for storing the state of coils	-	-	-

■ **Descriptions.**

1. This command is a User-Defined Function Block(UDFB) consisting of socket commands for Function Code 1, which reads the contiguous status of coils from 1 to 2000 in a remote device.
2. In case of an error, take appropriate actions based on the meaning represented by the string in ErrorString.

■ **Cautions.**

1. Before using this FB, must complete the Modbus TCP server connection and channel allocation using the SOCKET_TCPCONNECT or MODBUS_CONNECT UDFB.
2. Depending on the configuration of the connected server, if there is no data communication for a specific period or if the connection is terminated based on the various situations, may need to close the channel with SOCKET_CLOSE and reconnect before using it again.

MODBUS_READ_DISCRETE_INPUTS_FC02			Support			
This command performs the Modbus Function Code 02(FC02) operation. (Socket Command UDFB)			Communicate with the Modbus TCP Server.			
Function block						
<div><div><div><div>BOOL</div><div>Execute</div><div>Done</div><div>BOOL</div></div><div><div>USINT</div><div>Channel</div><div>Busy</div><div>BOOL</div></div><div><div>UINT</div><div>TimeOut</div><div>Error</div><div>BOOL</div></div><div><div>USINT</div><div>UnitID</div><div>Error String</div><div>STRING</div></div><div><div>WORD</div><div>Transaction</div><div>Coils</div><div>ARRAY[2000] OF BOOL</div></div><div><div>UINT</div><div>Address</div><div></div><div></div></div><div><div>UINT</div><div>QtyCoils</div><div></div><div></div></div></div></div>						
I/O	Type	Variable	Content	Scope	Unit	Default
Input	BOOL	Execute	Operating on the rising edge.	TRUE, FALSE	-	FALSE
	USINT	Channel	Input socket command channel for operation. (limited to the channel connected to the Modbus TCP server)	1~8	-	0
	UINT	TimeOut	Maximum response waiting time in sec. (0: unlimited waiting time.)	0~65535	Sec	0
	USINT	UnitID	Identification of a remote slave connected on a serial line or on other buses.	0~255	-	0
	WORD	Transaction	Transection number of Modbus frame.	16#0 to16#FFFF	-	0
	UINT	Address	Address for the discrete input to be read.	0 to 65535	-	0
	UINT	QtyCoils	The quantity of discrete input to be read.	0 to 2000	-	0

Output	BOOL	Done	Execution complete state.	TRUE, FALSE	-	-
	BOOL	Busy	Executing state.	TRUE, FALSE	-	-
	BOOL	Error	Error state.	TRUE, FALSE	-	-
	STRING	ErrorString	Details for error.	-	-	-
	ARRAY[2000] OF BOOL	Coils	Memory for storing the state of discrete inputs.	-	-	-

■ Descriptions.

1. This command is a User-Defined Function Block(UDFB) consisting of socket commands for Function Code 2, which reads the contiguous status of discrete inputs from 1 to 2000 in a remote device.
2. In case of an error, take appropriate actions based on the meaning represented by the string in ErrorString.

■ Cautions.

1. Before using this FB, must complete the Modbus TCP server connection and channel allocation using the SOCKET_TCPCONNECT or MODBUS_CONNECT UDFB.
2. Depending on the configuration of the connected server, if there is no data communication for a specific period or if the connection is terminated based on the various situations, may need to close the channel with SOCKET_CLOSE and reconnect before using it again.

MODBUS_READ_HOLDING_REGISTERS_FC03				Support		
This command performs the Modbus Function Code 03(FC03) operation. (Socket Command UDFB)				Communicate with the Modbus TCP Server .		
Function block						
<div><div><div><div>BOOL</div><div>Execute</div><div>Done</div><div>BOOL</div></div><div><div>USINT</div><div>Channel</div><div>Busy</div><div>BOOL</div></div><div><div>UINT</div><div>TimeOut</div><div>Error</div><div>BOOL</div></div><div><div>USINT</div><div>UnitID</div><div>Error String</div><div>STRING</div></div><div><div>WORD</div><div>Transaction</div><div>Registers</div><div>ARRAY[125] OF UINT</div></div><div><div>UINT</div><div>Address</div><div></div><div></div></div><div><div>UINT</div><div>RegisterQty</div><div></div><div></div></div></div></div>						
I/O	Type	Variable	Content	Scope	Unit	Defalut
Input	BOOL	Execute	Operating on the rising edge.	TRUE, FALSE	-	FALSE
	USINT	Channel	Input socket command channel for operation. (limited to the channel connected to the Modbus TCP server)	1~8	-	0
	UINT	TimeOut	Maximum response waiting time in sec. (0: unlimited waiting time.)	0~65535	Sec	0
	USINT	UnitID	Identification of a remote slave connected on a serial line or on other buses.	0~255	-	0
	WORD	Transaction	Transection number of Modbus frame.	16#0 to16#FFFF	-	0
	UINT	Address	Address for the holding register to be read.	0 to 65535	-	0
	UINT	RegisterQty	The quantity of holding registers to be read.	0 to 125	-	0

Output	BOOL	Done	Execution complete state.	TRUE, FALSE	-	-
	BOOL	Busy	Executing state.	TRUE, FALSE	-	-
	BOOL	Error	Error state.	TRUE, FALSE	-	-
	STRING	ErrorString	Details for error.	-	-	-
	ARRAY[125] OF UINT	Registers	Memory for storing the state of holding registers	-	-	-

■ Descriptions.

1. This command is a User-Defined Function Block(UDFB) consisting of socket commands for Function Code 3, which reads the contiguous block of holding registers from 1 to 125 in a remote device.
2. In case of an error, take appropriate actions based on the meaning represented by the string in ErrorString.

■ Cautions.

1. Before using this FB, must complete the Modbus TCP server connection and channel allocation using the SOCKET_TCPCONNECT or MODBUS_CONNECT UDFB.
2. Depending on the configuration of the connected server, if there is no data communication for a specific period or if the connection is terminated based on the various situations, may need to close the channel with SOCKET_CLOSE and reconnect before using it again.

MODBUS_READ_INPUT_REGISTERS_FC04			Support			
This command performs the Modbus Function Code 04(FC04) operation. (Socket Command UDFB)			Communicate with the Modbus TCP Server.			
Function block						
<div><div><div><div>BOOL</div><div>Execute</div><div>Done</div><div>BOOL</div></div><div><div>USINT</div><div>Channel</div><div>Busy</div><div>BOOL</div></div><div><div>UINT</div><div>TimeOut</div><div>Error</div><div>BOOL</div></div><div><div>USINT</div><div>UnitID</div><div>Error String</div><div>STRING</div></div><div><div>WORD</div><div>Transaction</div><div>Registers</div><div>ARRAY[125] OF UINT</div></div><div><div>UINT</div><div>Address</div><div></div><div></div></div><div><div>UINT</div><div>RegisterQty</div><div></div><div></div></div></div></div>						
I/O	Type	Variable	Content	Scope	Unit	Default
Input	BOOL	Execute	Operating on the rising edge.	TRUE, FALSE	-	FALSE
	USINT	Channel	Input socket command channel for operation. (limited to the channel connected to the Modbus TCP server)	1~8	-	0
	UINT	TimeOut	Maximum response waiting time in sec. (0: unlimited waiting time.)	0~65535	Sec	0
	USINT	UnitID	Identification of a remote slave connected on a serial line or on other buses.	0~255	-	0
	WORD	Transaction	Transection number of Modbus frame.	16#0 to16#FFFF	-	0
	UINT	Address	Address for the input register to be read.	0 to 65535	-	0
	UINT	RegisterQty	The quantity of input registers to be read.	0 to 125	-	0

Output	BOOL	Done	Execution complete state.	TRUE, FALSE	-	-
	BOOL	Busy	Executing state.	TRUE, FALSE	-	-
	BOOL	Error	Error state.	TRUE, FALSE	-	-
	STRING	ErrorString	Details for error.	-	-	-
	ARRAY[125] OF UINT	Registers	Memory for storing the state of input registers	-	-	-

■ Descriptions.

1. This command is a User-Defined Function Block(UDFB) consisting of socket commands for Function Code 4, which reads the contiguous block of input registers from 1 to 125 in a remote device.
2. In case of an error, take appropriate actions based on the meaning represented by the string in ErrorString.

■ Cautions.

1. Before using this FB, must complete the Modbus TCP server connection and channel allocation using the SOCKET_TCPCONNECT or MODBUS_CONNECT UDFB.
2. Depending on the configuration of the connected server, if there is no data communication for a specific period or if the connection is terminated based on the various situations, may need to close the channel with SOCKET_CLOSE and reconnect before using it again.

				FALSE		
Output	BOOL	Done	Execution complete state.	TRUE, FALSE	-	-
	BOOL	Busy	Executing state.	TRUE, FALSE	-	-
	BOOL	Error	Error state.	TRUE, FALSE	-	-
	STRING	ErrorString	Details for error.	-	-	-

■ Descriptions.

1. This command is a User-Defined Function Block(UDFB) consisting of socket commands for Function Code 5, which writes a single coil in a remote device.
2. In case of an error, take appropriate actions based on the meaning represented by the string in ErrorString.

■ Cautions.

1. Before using this FB, must complete the Modbus TCP server connection and channel allocation using the SOCKET_TCPCONNECT or MODBUS_CONNECT UDFB.
2. Depending on the configuration of the connected server, if there is no data communication for a specific period or if the connection is terminated based on the various situations, may need to close the channel with SOCKET_CLOSE and reconnect before using it again.

Output	BOOL	Done	Execution complete state.	TRUE, FALSE	-	-
	BOOL	Busy	Executing state.	TRUE, FALSE	-	-
	BOOL	Error	Error state.	TRUE, FALSE	-	-
	STRING	ErrorString	Details for error.	-	-	-

■ Descriptions.

1. This command is a User-Defined Function Block(UDFB) consisting of socket commands for Function Code 6, which writes a single register in a remote device.
2. In case of an error, take appropriate actions based on the meaning represented by the string in ErrorString.

■ Cautions.

1. Before using this FB, must complete the Modbus TCP server connection and channel allocation using the SOCKET_TCPCONNECT or MODBUS_CONNECT UDFB.
2. Depending on the configuration of the connected server, if there is no data communication for a specific period or if the connection is terminated based on the various situations, may need to close the channel with SOCKET_CLOSE and reconnect before using it again.

MODBUS_WRITE_MULTIPLE_COILS_FC15			Support			
This command performs the Modbus Function Code 15(FC15) operation. (Socket Command UDFB)			Communicate with the Modbus TCP Server .			
Function block						
<div><div><div><div>BOOL</div><div>Execute Done</div><div>BOOL</div></div><div><div>USINT</div><div>Channel Busy</div><div>BOOL</div></div><div><div>UINT</div><div>TimeOut Error</div><div>BOOL</div></div><div><div>USINT</div><div>UnitID Error String</div><div>STRING</div></div><div><div>WORD</div><div>Transaction</div><div></div></div><div><div>UINT</div><div>Address</div><div></div></div><div><div>UINT</div><div>QtyCoils</div><div></div></div><div><div>ARRAY[1968] OF BOOL</div><div>Coils</div></div></div></div>						
I/O	Type	Variable	Content	Scope	Unit	Defalut
Input	BOOL	Execute	Operating on the rising edge.	TRUE, FALSE	-	FALSE
	USINT	Channel	Input socket command channel for operation. (limited to the channel connected to the Modbus TCP server)	1~8	-	0
	UINT	TimeOut	Maximum response waiting time in sec. (0: unlimited waiting time.)	0~65535	Sec	0
	USINT	UnitID	Identification of a remote slave connected on a serial line or on other buses.	0~255	-	0
	WORD	Transaction	Transection number of Modbus frame.	16#0 to16#FFFF	-	0
	UINT	Address	Address for the coil to be written.	0 to 65535	-	0
	UINT	QtyCoils	The quantity of coils to be	0 to 1968	-	0

			written.			
	ARRAY[1968] OF BOOL	Coils	State of the coils to be written in 8-bit units.	-	-	-
Output	BOOL	Done	Execution complete state.	TRUE, FALSE	-	-
	BOOL	Busy	Executing state.	TRUE, FALSE	-	-
	BOOL	Error	Error state.	TRUE, FALSE	-	-
	STRING	ErrorString	Details for error.	-	-	-

■ Descriptions.

1. This command is a User-Defined Function Block(UDFB) consisting of socket commands for Function Code 15, which writes the contiguous status of multiple coils from 1 to 1968 in a remote device.
2. In case of an error, take appropriate actions based on the meaning represented by the string in ErrorString.

■ Cautions.

1. Before using this FB, must complete the Modbus TCP server connection and channel allocation using the SOCKET_TCPCONNECT or MODBUS_CONNECT UDFB.
2. Depending on the configuration of the connected server, if there is no data communication for a specific period or if the connection is terminated based on the various situations, may need to close the channel with SOCKET_CLOSE and reconnect before using it again.

MODBUS_WRITE_MULTIPLE_REGISTERS_FC16				Support		
This command performs the Modbus Function Code 16(FC16) operation. (Socket Command UDFB)				Communicate with the Modbus TCP Server.		
Function block						
<div><div><div><div>BOOL</div><div>Execute</div><div>Done</div><div>BOOL</div></div><div><div>USINT</div><div>Channel</div><div>Busy</div><div>BOOL</div></div><div><div>UINT</div><div>TimeOut</div><div>Error</div><div>BOOL</div></div><div><div>USINT</div><div>UnitID</div><div>Error String</div><div>STRING</div></div><div><div>WORD</div><div>Transaction</div><div></div><div></div></div><div><div>UINT</div><div>Address</div><div></div><div></div></div><div><div>UINT</div><div>RegisterQty</div><div></div><div></div></div><div><div>ARRAY[123] OF UINT</div><div>Registers</div><div></div><div></div></div></div></div>						
I/O	Type	Variable	Content	Scope	Unit	Default
Input	BOOL	Execute	Operating on the rising edge.	TRUE, FALSE	-	FALSE
	USINT	Channel	Input socket command channel for operation. (limited to the channel connected to the Modbus TCP server)	1~8	-	0
	UINT	TimeOut	Maximum response waiting time in sec. (0: unlimited waiting time.)	0~65535	Sec	0
	USINT	UnitID	Identification of a remote slave connected on a serial line or on other buses.	0~255	-	0
	WORD	Transaction	Transection number of Modbus frame.	16#0 to16#FFFF	-	0
	UINT	Address	Address for the register to be written.	0 to 65535	-	0

	UINT	RegisterQty	The quantity of registers to be written.	0 to 123	-	0
	ARRAY[123] OF UINT	Registers	Value of the registers to be written.	-	-	-
Output	BOOL	Done	Execution complete state.	TRUE, FALSE	-	-
	BOOL	Busy	Executing state.	TRUE, FALSE	-	-
	BOOL	Error	Error state.	TRUE, FALSE	-	-
	STRING	ErrorString	Details for error.	-	-	-

■ Descriptions.

1. This command is a User-Defined Function Block(UDFB) consisting of socket commands for Function Code 16, which writes the contiguous value of multiple registers from 1 to 123 in a remote device.
2. In case of an error, take appropriate actions based on the meaning represented by the string in ErrorString.

■ Cautions.

1. Before using this FB, must complete the Modbus TCP server connection and channel allocation using the SOCKET_TCPCONNECT or MODBUS_CONNECT UDFB.
2. Depending on the configuration of the connected server, if there is no data communication for a specific period or if the connection is terminated based on the various situations, may need to close the channel with SOCKET_CLOSE and reconnect before using it again.

■ Sample Program

● Local Variables

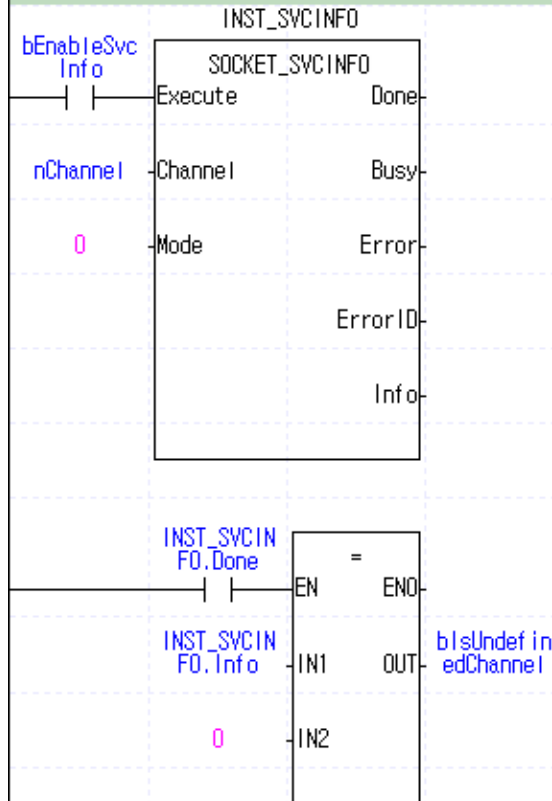
Variable Type	Variable	Type
VAR	Address	WORD
VAR	awResult_ReadRegister	ARRAY[0..124] OF WORD
VAR	bCompleteTest	BOOL
VAR	bEnableCommunication	BOOL
VAR	bEnableSvcInfo	BOOL
VAR	bIsUndefinedChannel	BOOL
VAR	bReadyToChannel	BOOL
VAR	bReadyToCommunication	BOOL
VAR	bUsedChannelClosed	BOOL
VAR	Coil	BOOL
VAR	Coils	ARRAY[0..1999] OF BOOL
VAR	INST_CLOSE	SOCKET_CLOSE
VAR	INST_DISCRETE_INPUTS_FC02	MODBUS_READ_DISCRETE_INPUTS_FC02
VAR	INST_READ_COILS_FC01	MODBUS_READ_COILS_FC01
VAR	INST_READ_HOLDING_REG_FC03	MODBUS_READ_HOLDING_REGISTER_FC03
VAR	INST_READ_INPUT_REG_FC04	MODBUS_READ_INPUT_REGISTERS_FC04
VAR	INST_READ_INPUT_REG_FC05	MODBUS_READ_INPUT_REGISTERS_FC04
VAR	INST_SVCINFO	SOCKET_SVCINFO
VAR	INST_TCPCONNECT	SOCKET_TCPCONNECT
VAR	INST_WRITE_MULTIPLE_COILS_FC15	MODBUS_WRITE_MULTIPLE_COILS_FC15
VAR	INST_WRITE_MULTIPLE_COILS_FC16	MODBUS_WRITE_MULTIPLE_COILS_FC15
VAR	INST_WRITE_MULTI_REG_FC16	MODBUS_WRITE_MULTIPLE_REGISTERS_FC16
VAR	INST_WRITE_SINGLE_COIL_FC05	MODBUS_WRITE_SINGLE_COIL_FC05
VAR	INST_WRITE_SINGLE_COIL_FC06	MODBUS_WRITE_SINGLE_COIL_FC05
VAR	INST_WRITE_SINGLE_REG_FC06	MODBUS_WRITE_SINGLE_REGISTER_FC06
VAR	INST_WRITE_SINGLE_REG_FC07	MODBUS_WRITE_SINGLE_REGISTER_FC06
VAR	nChannel	USINT
VAR	nTransactionCount	WORD
VAR	QtyCoils	WORD
VAR	Register	WORD
VAR	RegisterQty	WORD
VAR	Registers	ARRAY[0..124] OF WORD
VAR	TargetIP	ARRAY[0..3] OF USINT
VAR	WCoils	ARRAY[0..245] OF BYTE
VAR	WRegisters	ARRAY[0..122] OF WORD
VAR	wResult_ReadCoil_W	WORD

- Program

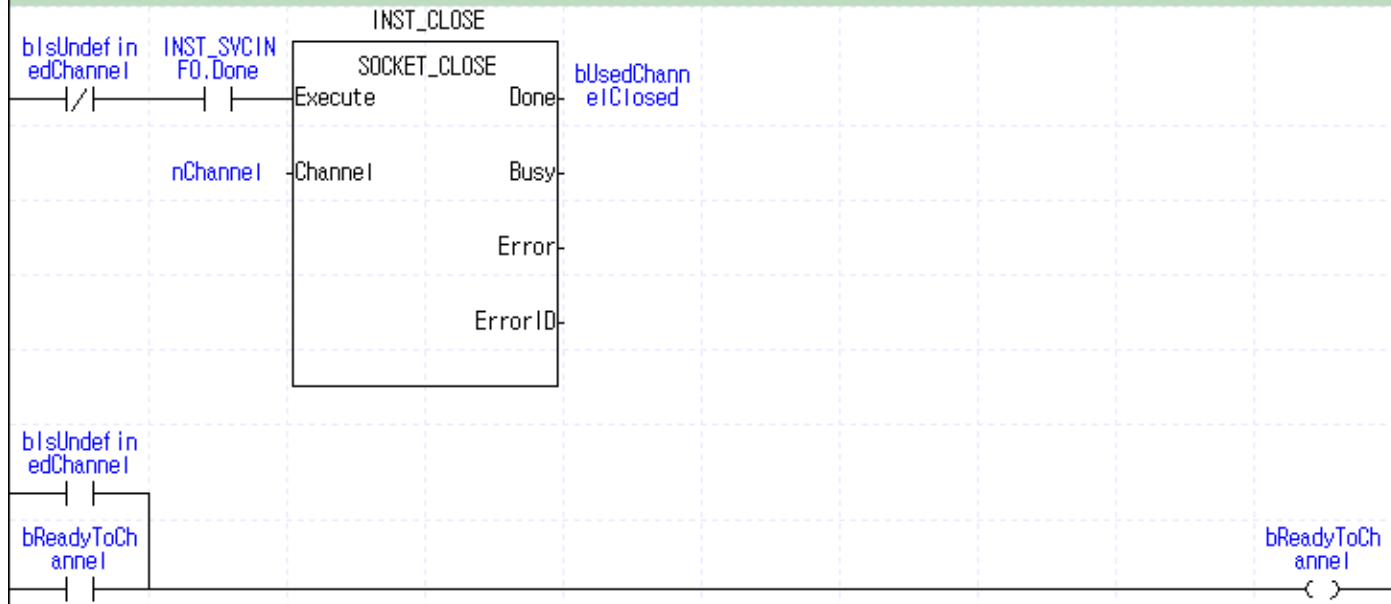
This sample program demonstrates how to use the Modbus TCP client Function Block (FB) with basic socket commands. If you need detail of the associated with socket command, please reference instruction manual.

Step1. Connect to the Modbus TCP Server. In this sample, client is this program, sever application is own modbus server. So, Local Port is default port of the Modbus TCP Server 502 and Target IP address is 127.0.0.1(localhost).

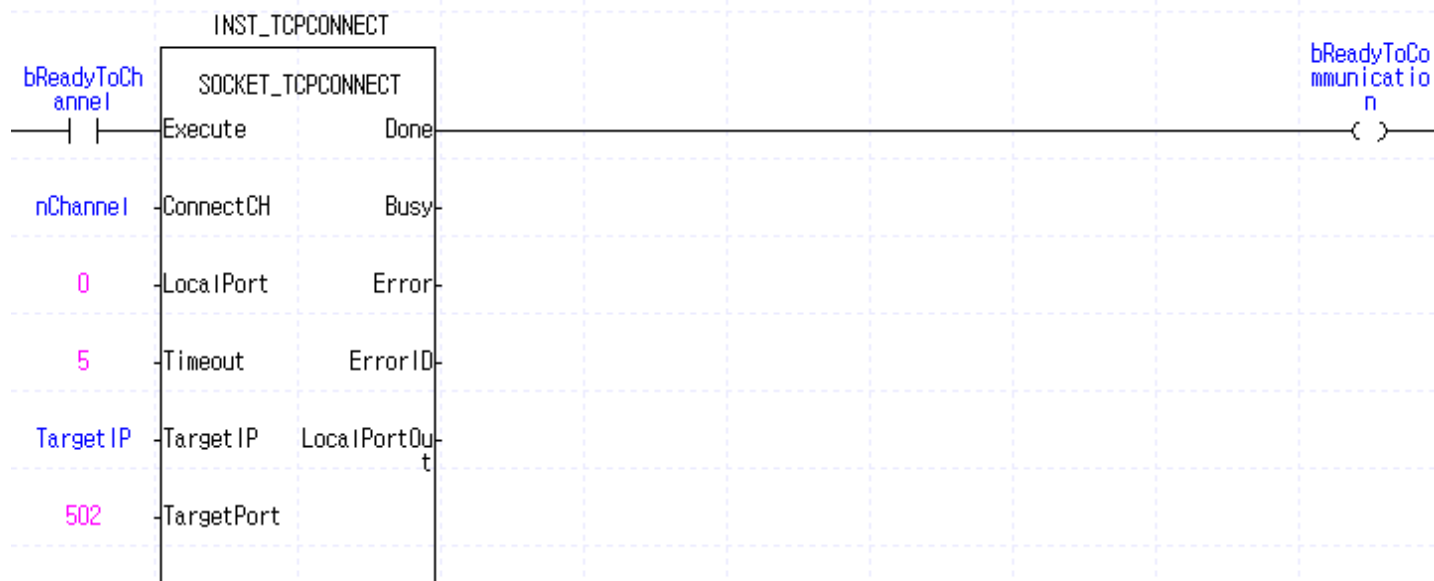
Step 1-1. Check the validity of the socket command channel with SOCKET_SVCINFO.(optional), Channel: Channel of the to check the Mode 0(Channel Type). Done is true and Info value is 0(SocketUndefined) means that, no any use Channel.



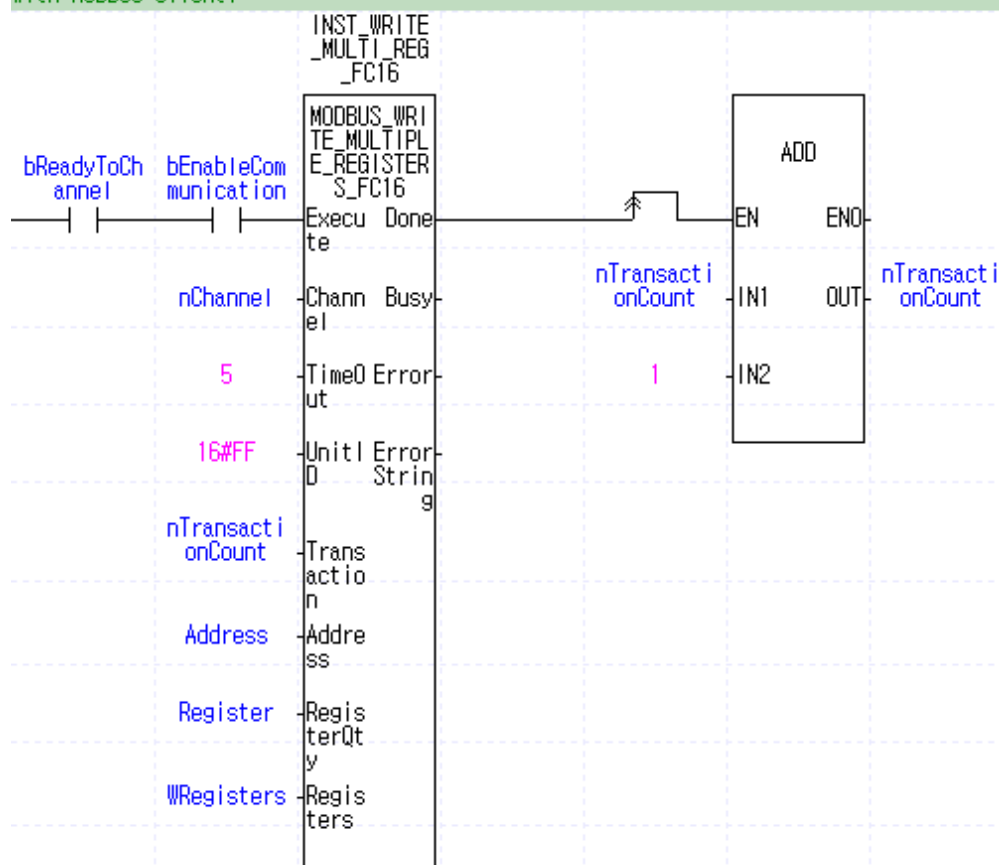
Step1-2, if **bIsUndefinedChannel** is false, means than this channel number is now using the another connection or another socket command procedure. In this case you can choose to close that channel or use another channel number.



Step2. Connect to Modbus TCP Server.(connect to the local modbus tcp server)



Step3. If connect to the modbus server successfully then bReadyToCommunication variable sets to the true. Finally, You can use Function Block(FB) of associated with MODBUS Client.



설명문

Step4. if you got a error during communication or communication complete, must have to close using socket channel for returning resource.

L134

bCompleteTest

INST_CLOSE

SOCKET_CLOSE

Execute Done

L135

nChannel

Channel

Busy

L136

Error

L137

ErrorID

L138

L139