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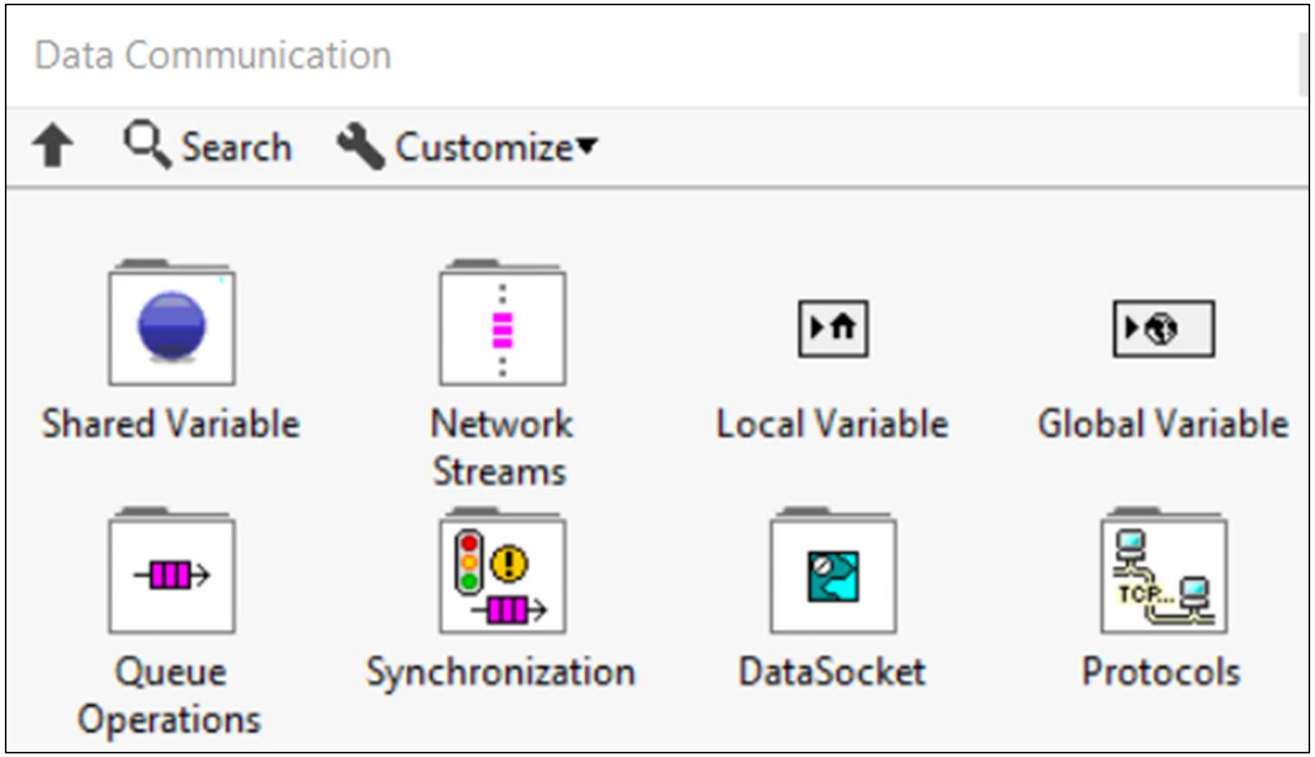
Cyber-Physical Industrial Systems

Module 3 Session 3

Data communication basics

Lecture

Data Communication methods



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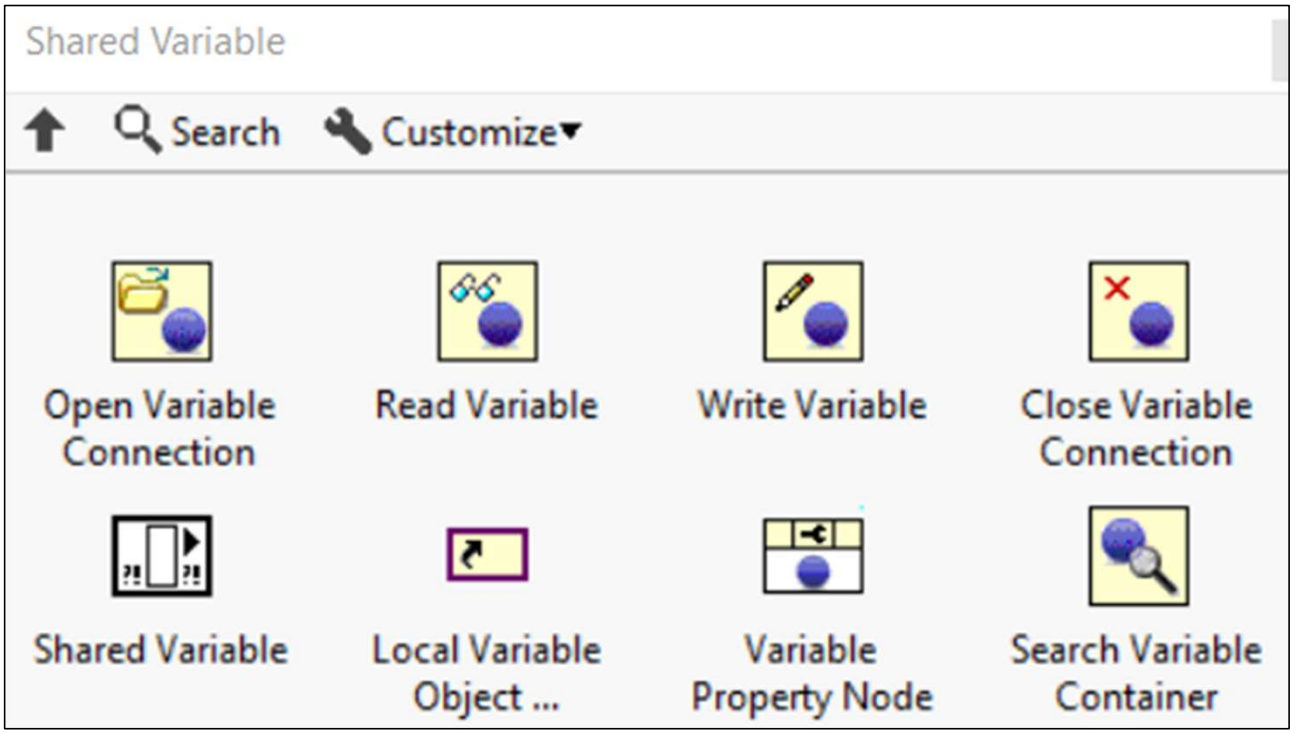
Shared Variable functions



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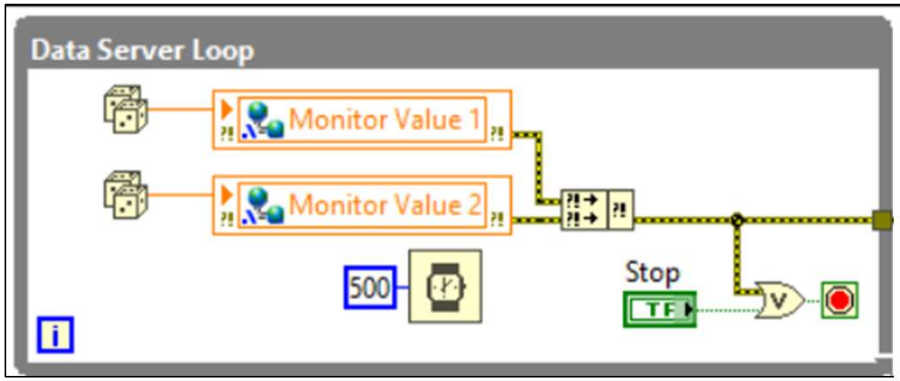
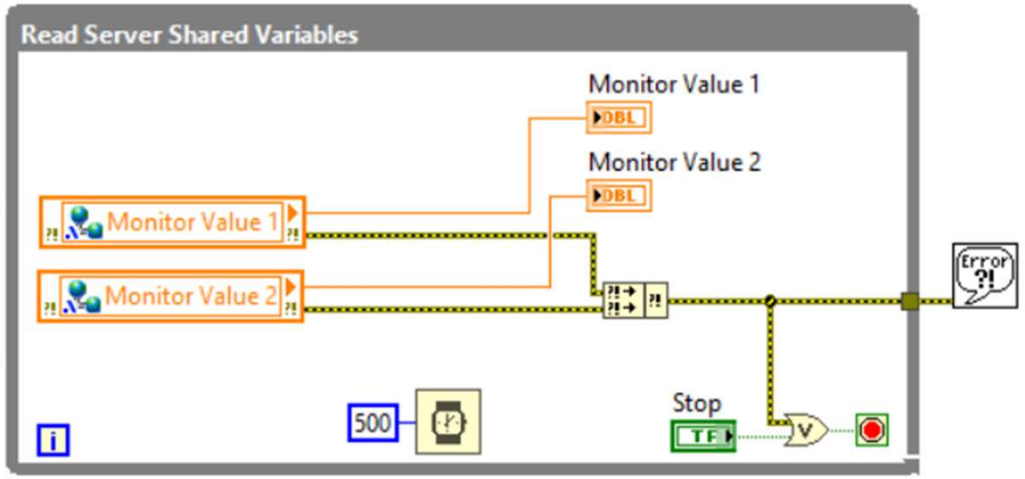
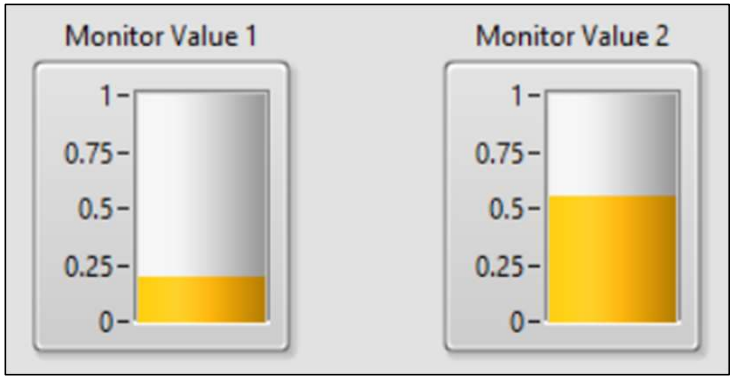
Shared variable example







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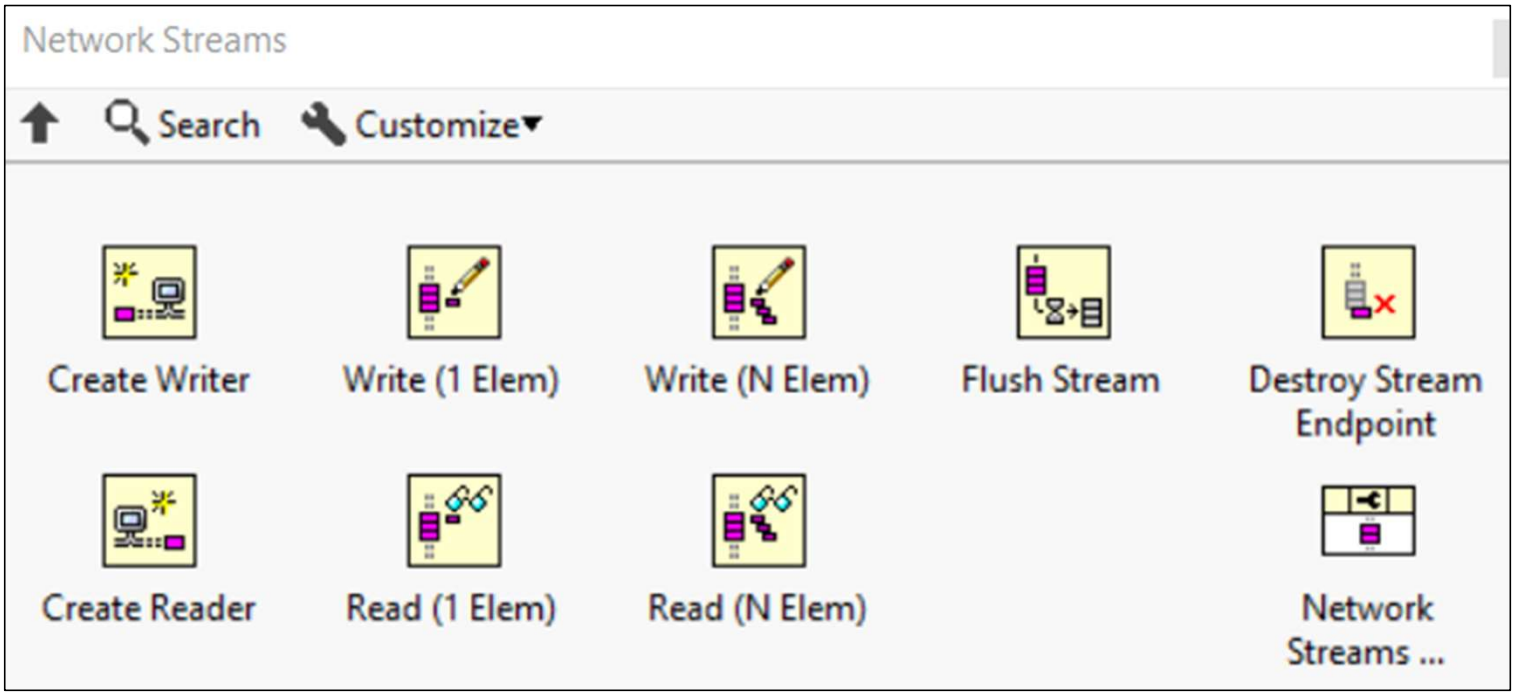
Network Streams functions



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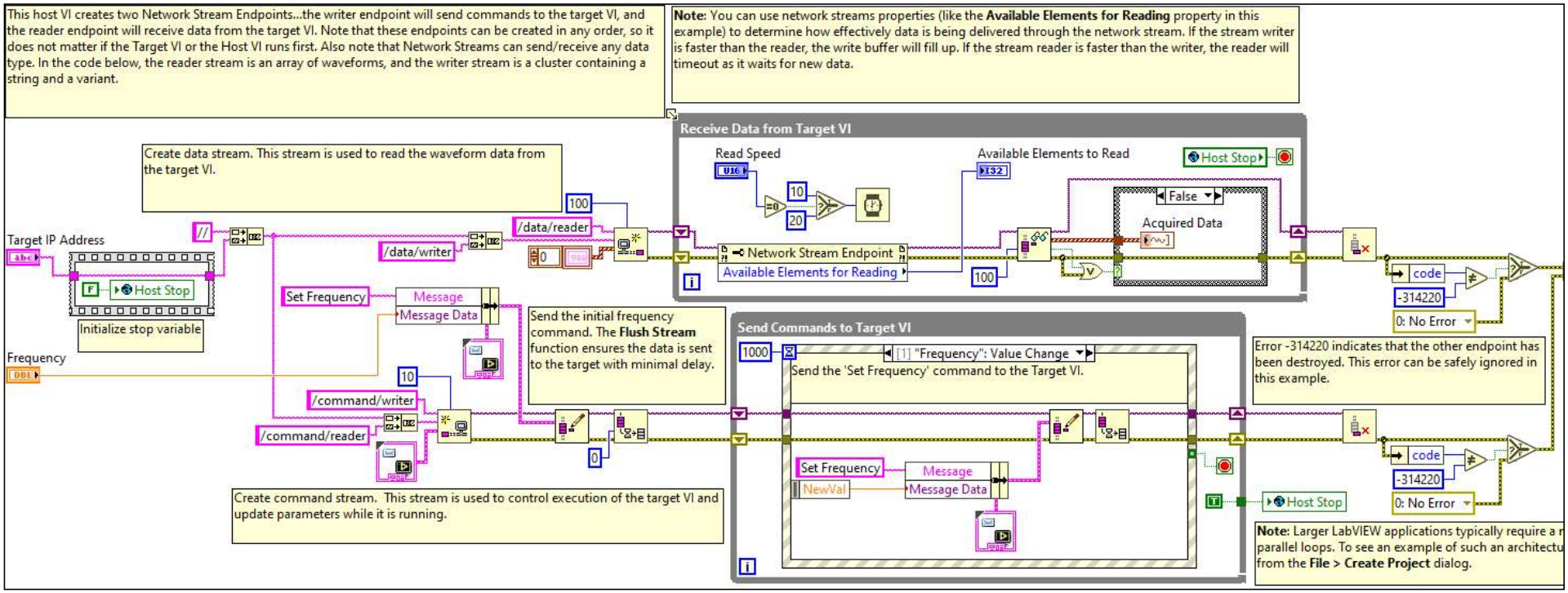
Network stream host



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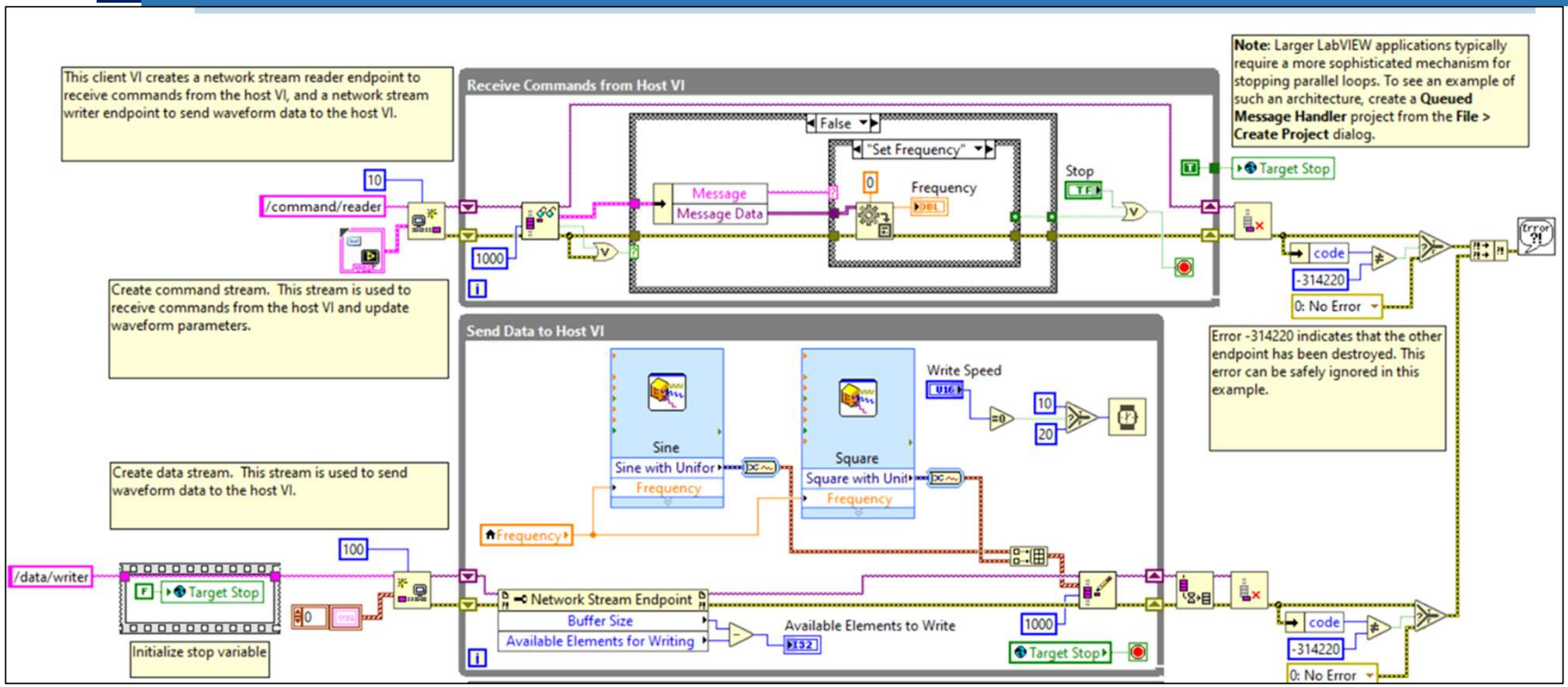
Network stream target



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Network Streams example

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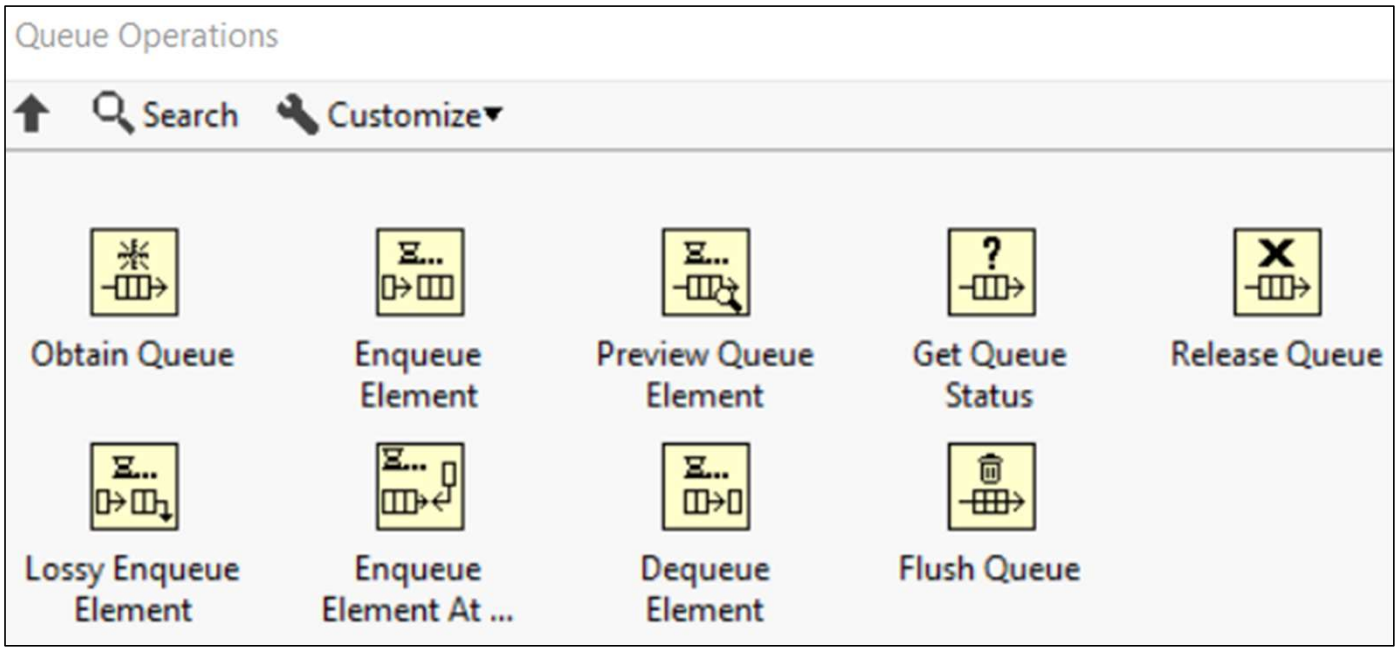
Queue Operations functions



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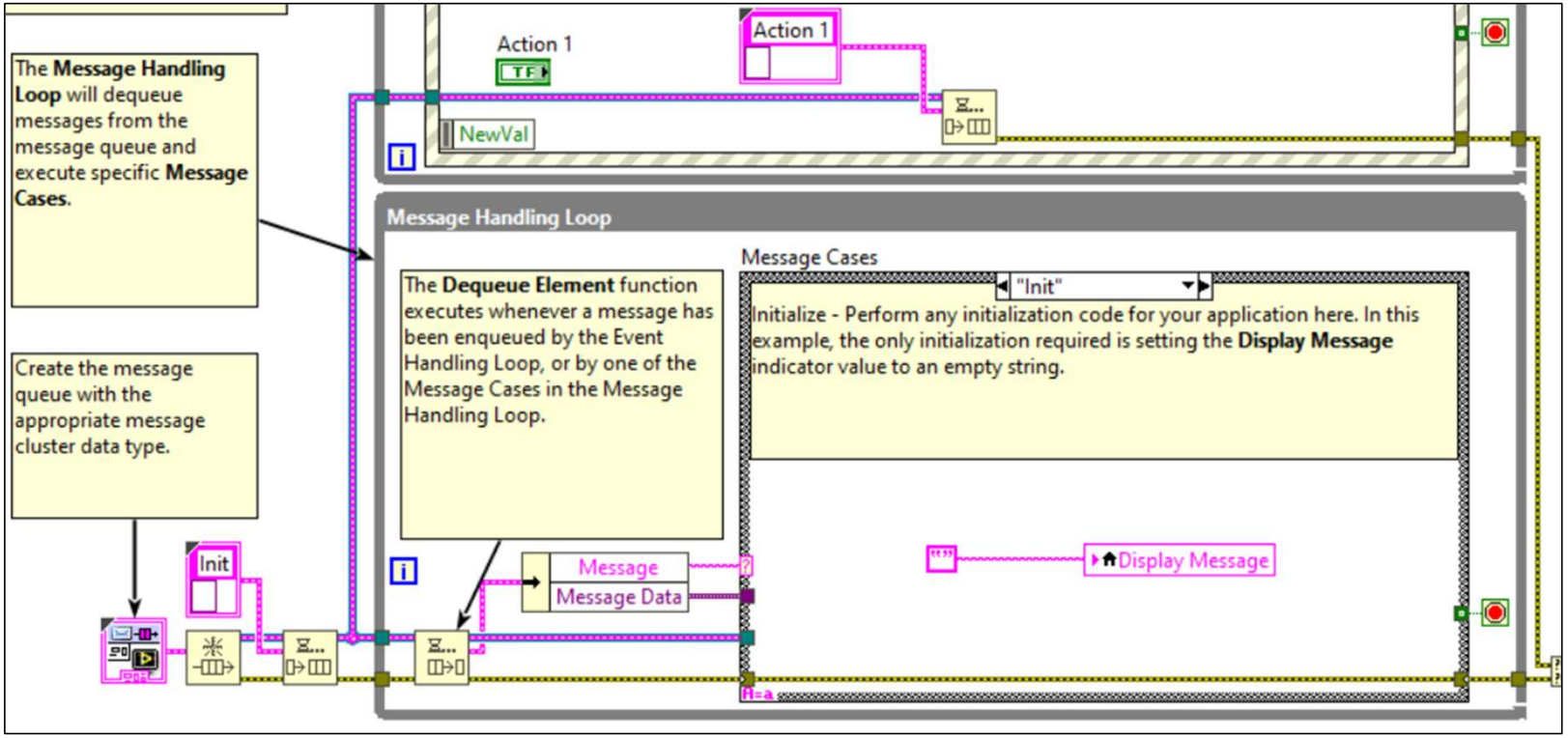
Queue Operations example



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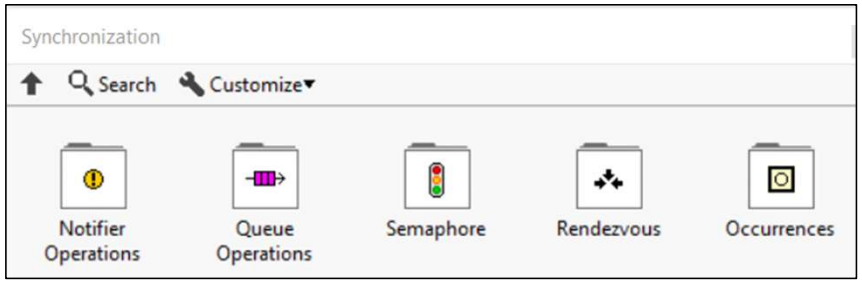
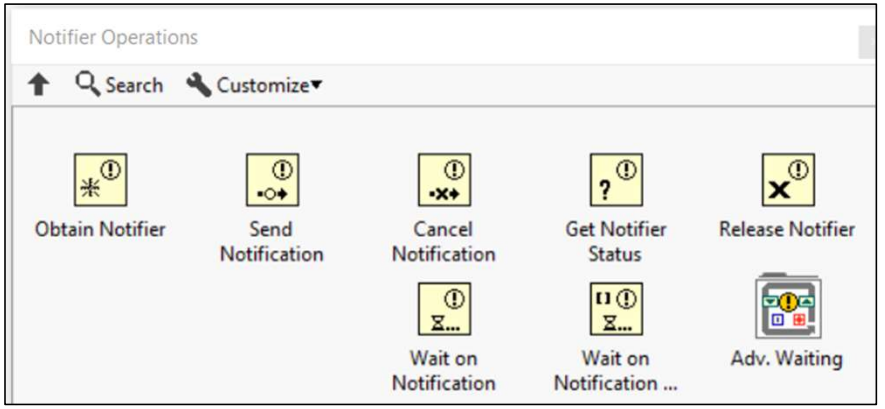
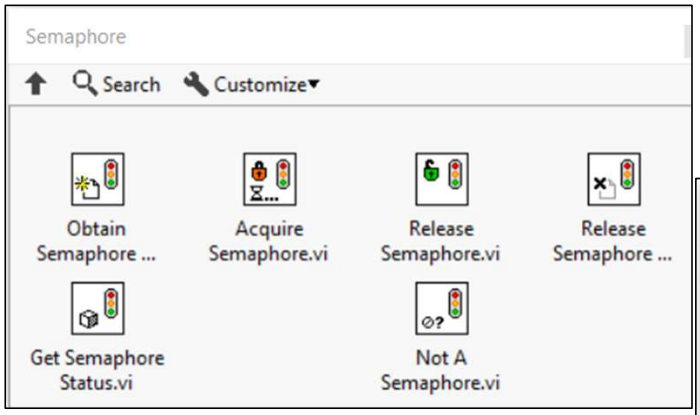
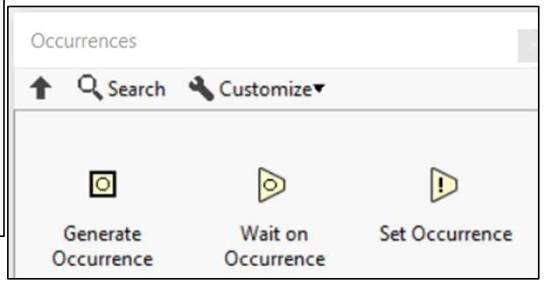
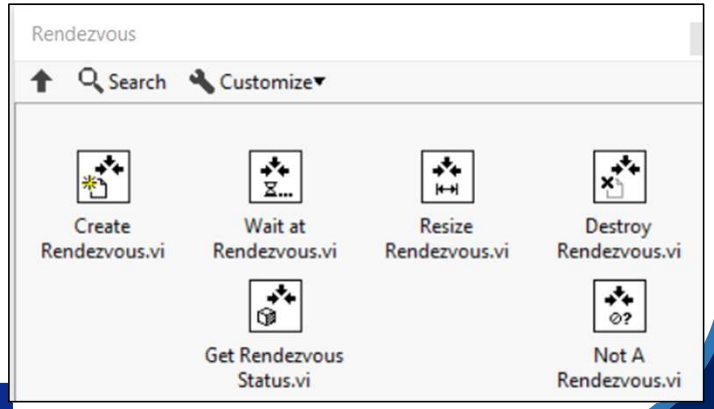
Other Synchronization methods











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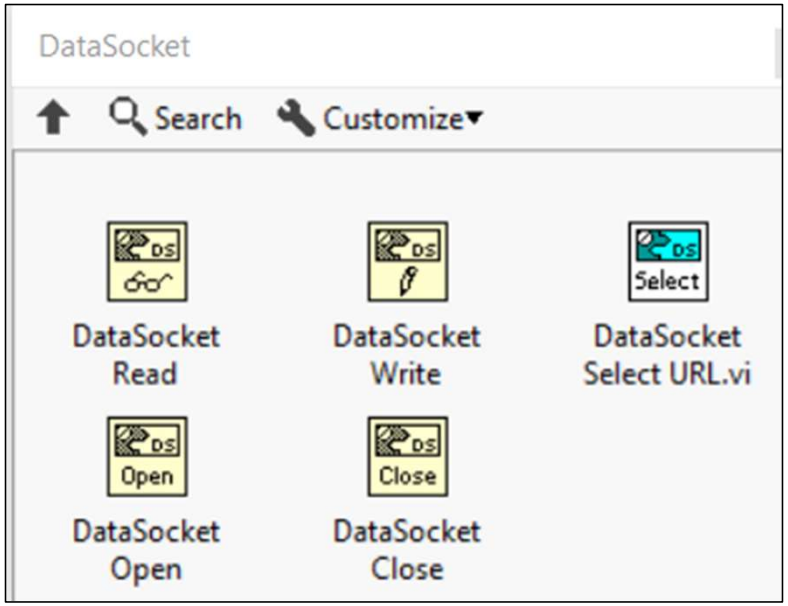
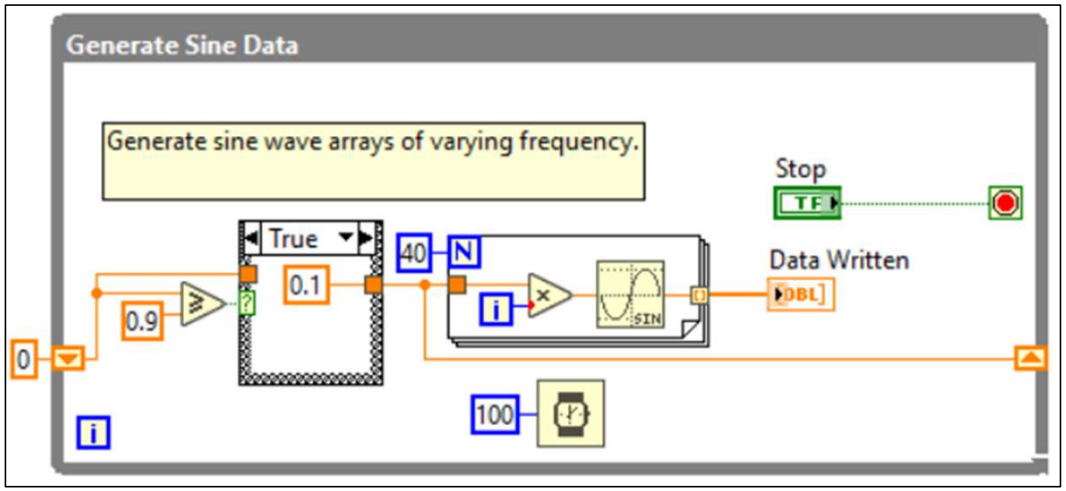
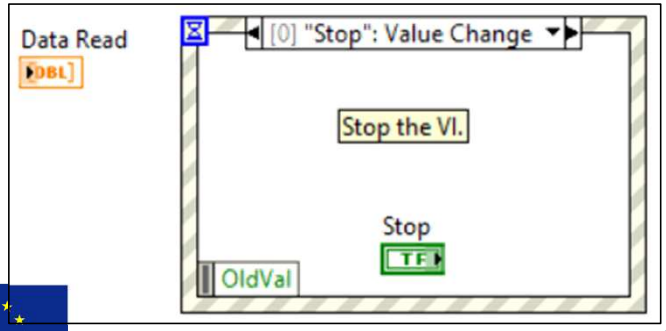
DataSocket functions and example







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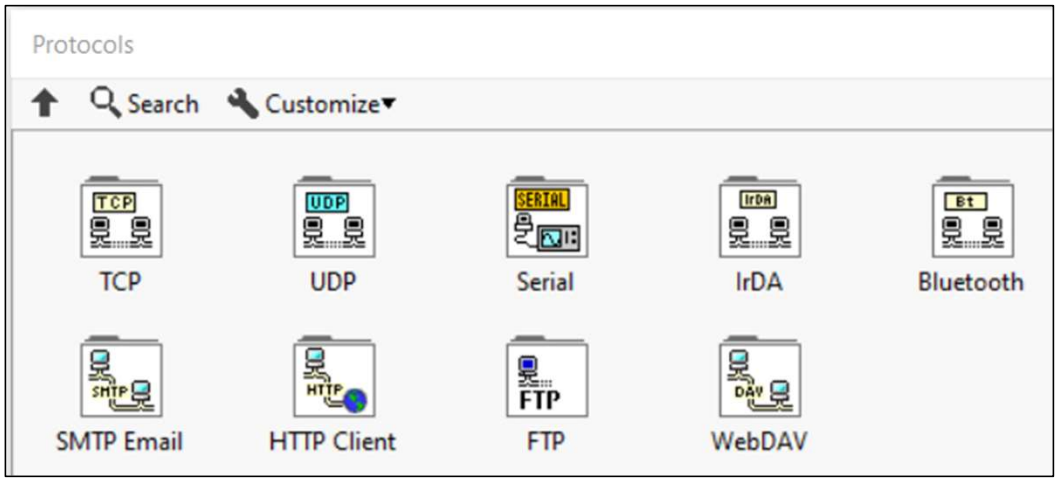
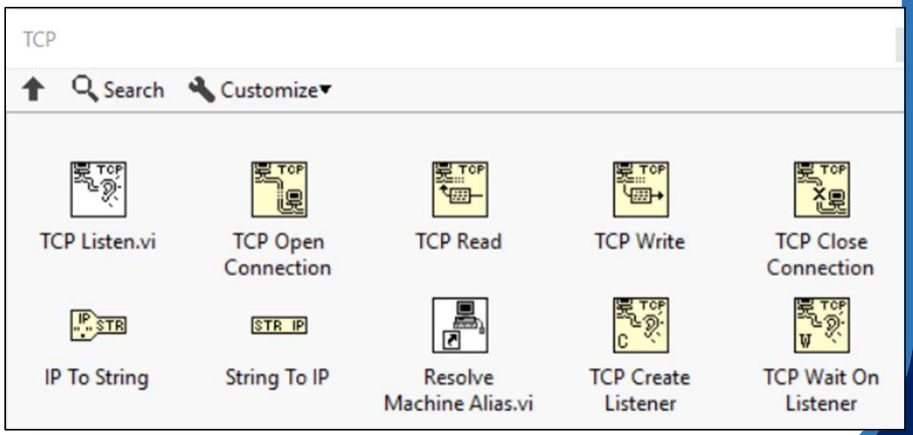
Main Internet communications protocols





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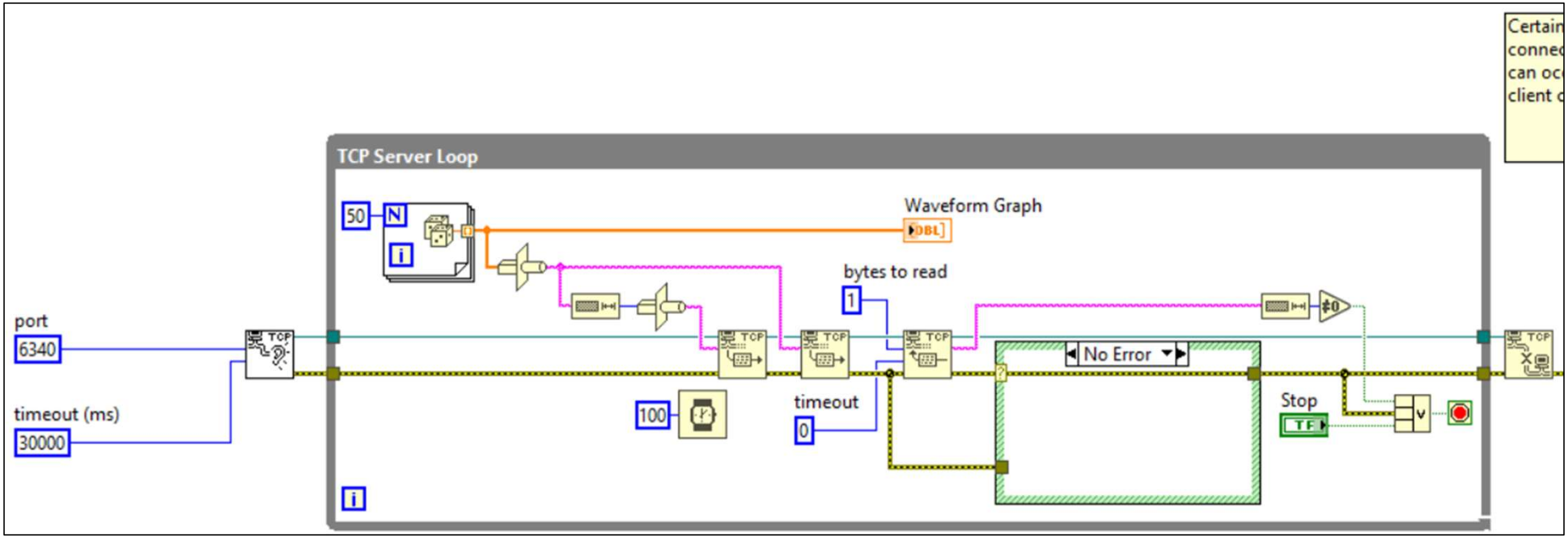
TCP Server example



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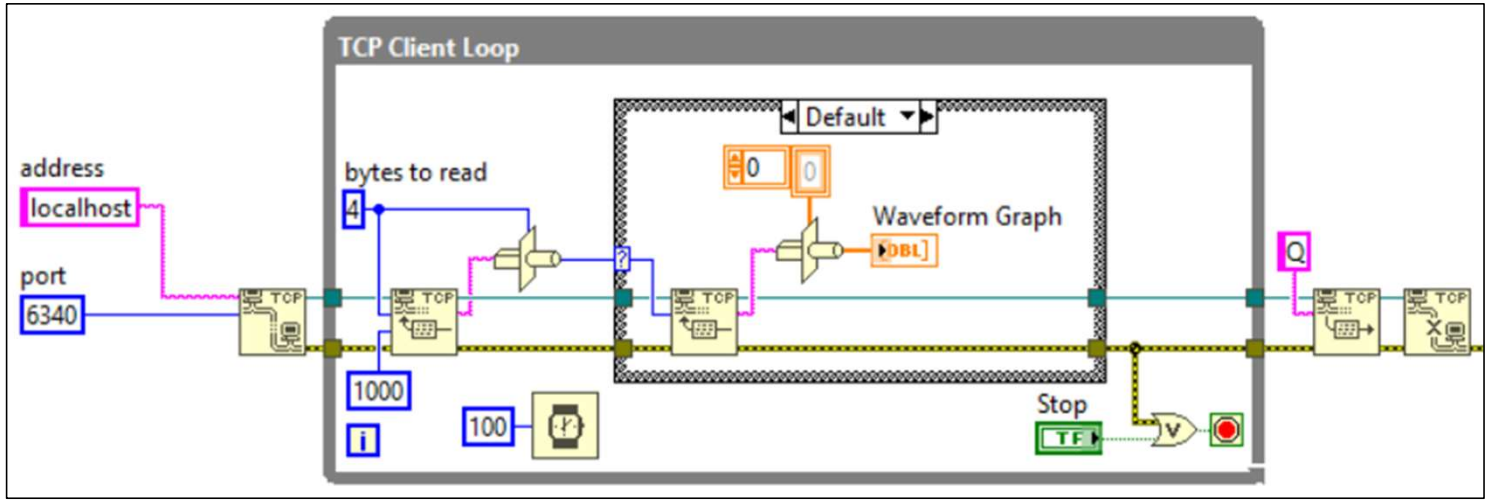
TCP Client example



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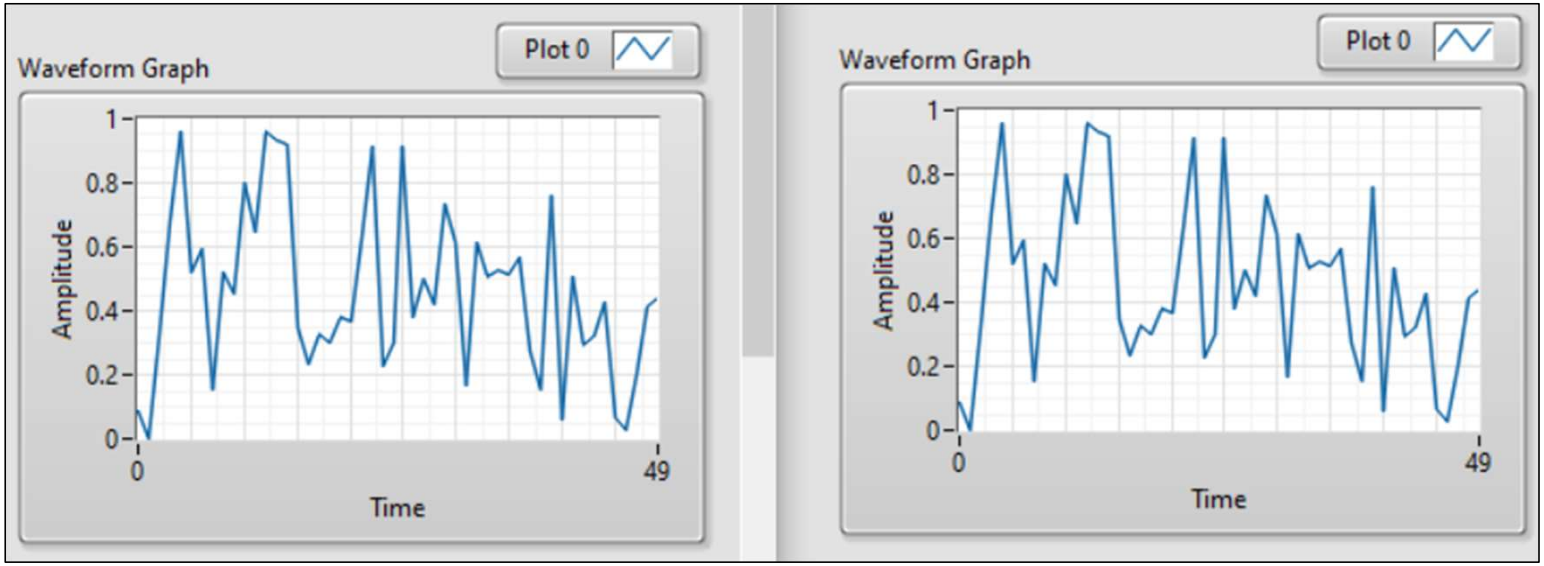
TCP data transfer example



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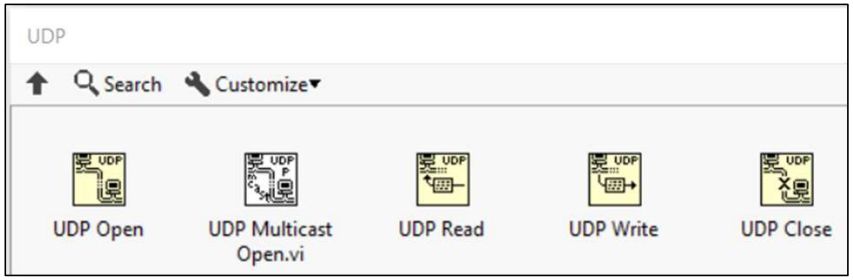
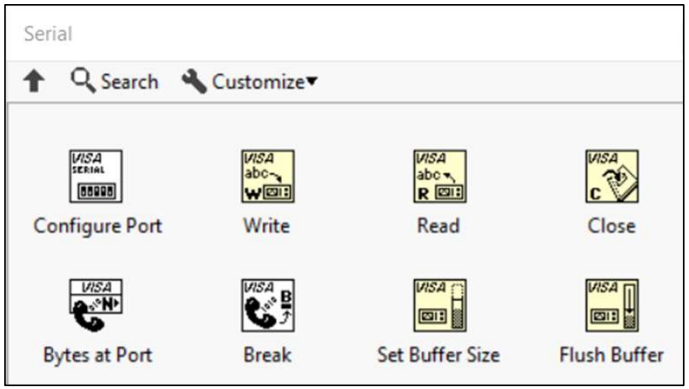
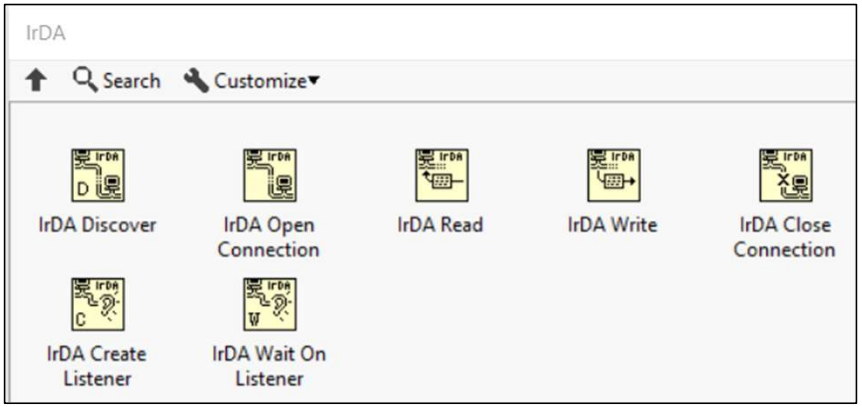
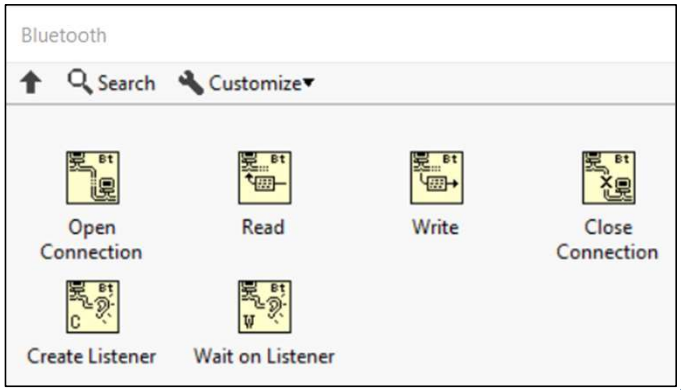
Simple serial communication protocols









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Serial communication syntax example

Setting of set points for temperature and humidity[2)]

The following string sets the set points for temperature and humidity[2)] to 25°C and 35% relative humidity and starts control.

Send string (PC → controller)

zT025.0F35R1100000000000000CC

Response string (controller → PC)

z{ACK}CC	if the string has been accepted
z{NAK}CC	if the string has not been accepted because, for instance, one of the set points is beyond the input limits.

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Serial communication syntax example

getinfo

Response details	Description
INI	Device Initialization Time
RTC	RTC Time
RST	Restart Counter
ERR	Error Counter
SR	Number of Sent Records
BR	Number of broken records
CF	Profile CRC Fail counter
FG	Failed GPRS counter
FL	Failed link counter
UT	UPD Timeout counter
SMS	Sent SMS Counter
NOGPS	No GPS Timer
GPS	GPS receiver state. 0 – OFF, 1 – restarting, 2 – ON but no fix, 3 – ON and operational, 4 – sleep mode
SAT	Average satellites
RS	Reset Source Identification

Example: INI:2007/8/24 10:15 RTC:2007/8/24 12:43 RST:2 ERR:11 SR:182 BR:0 CF:0 FG:0 FL:0 UT:0 SMS:2 NOGPS:0:0 GPS:3 SAT:7 RS:7

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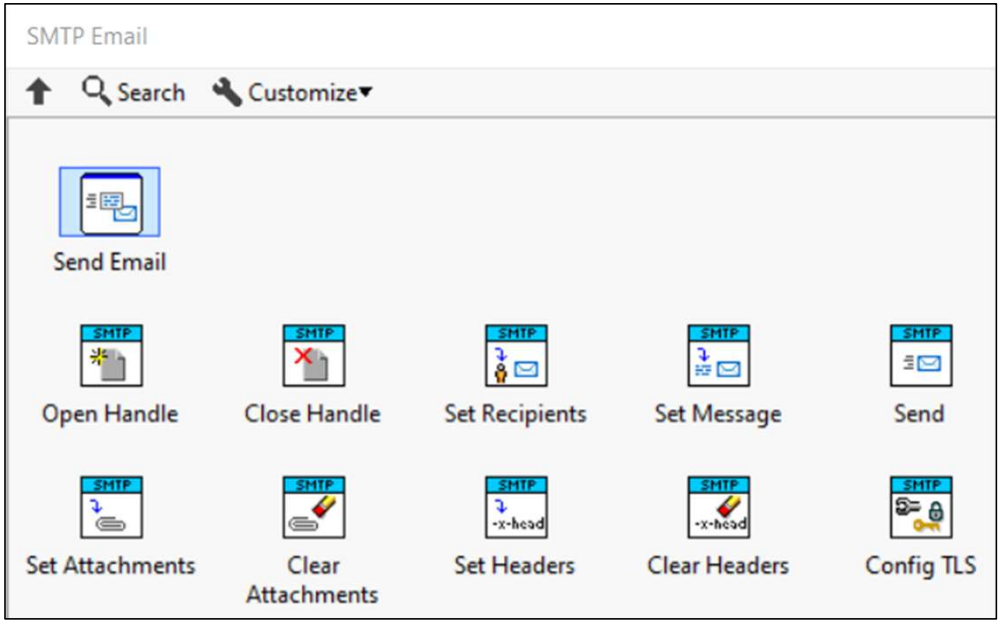
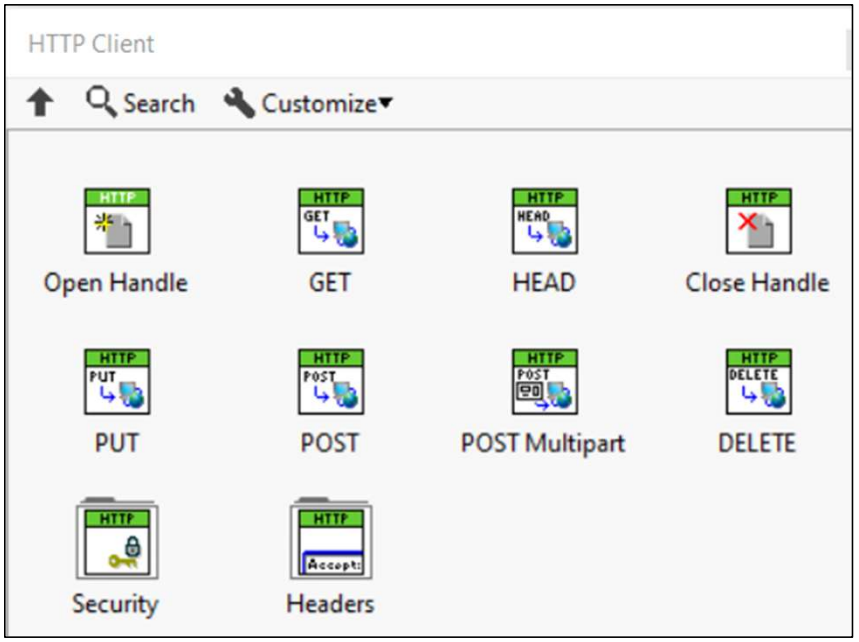
Email and HTTP functions





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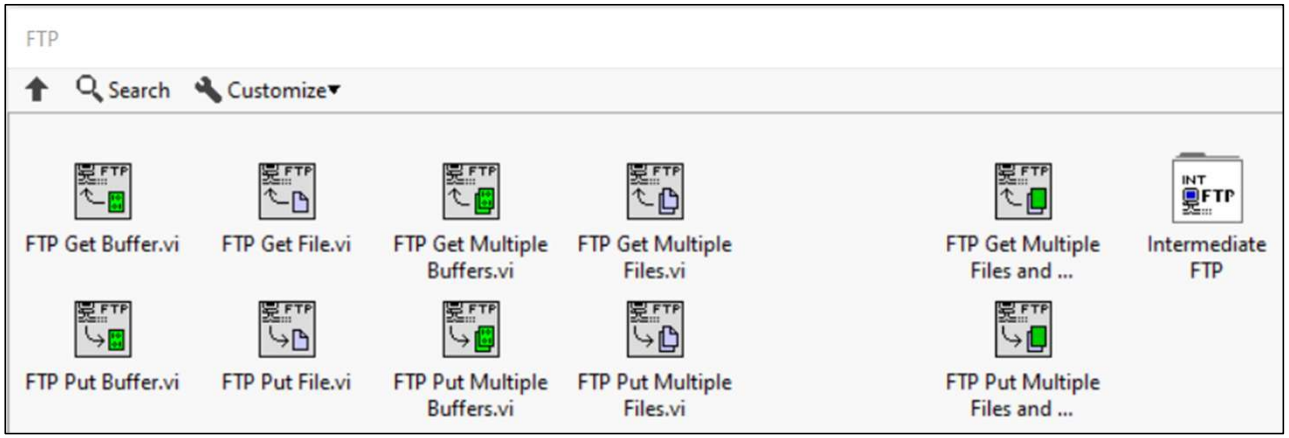
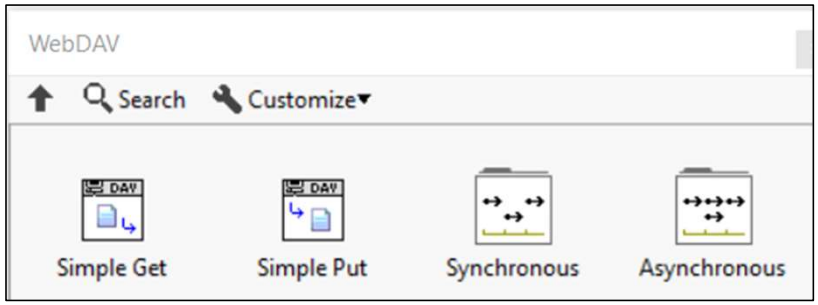
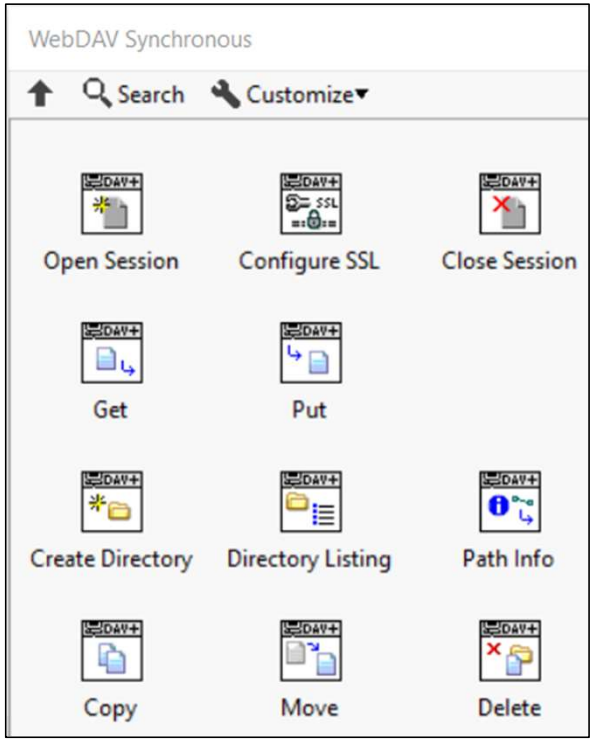
File Transfer Protocols







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