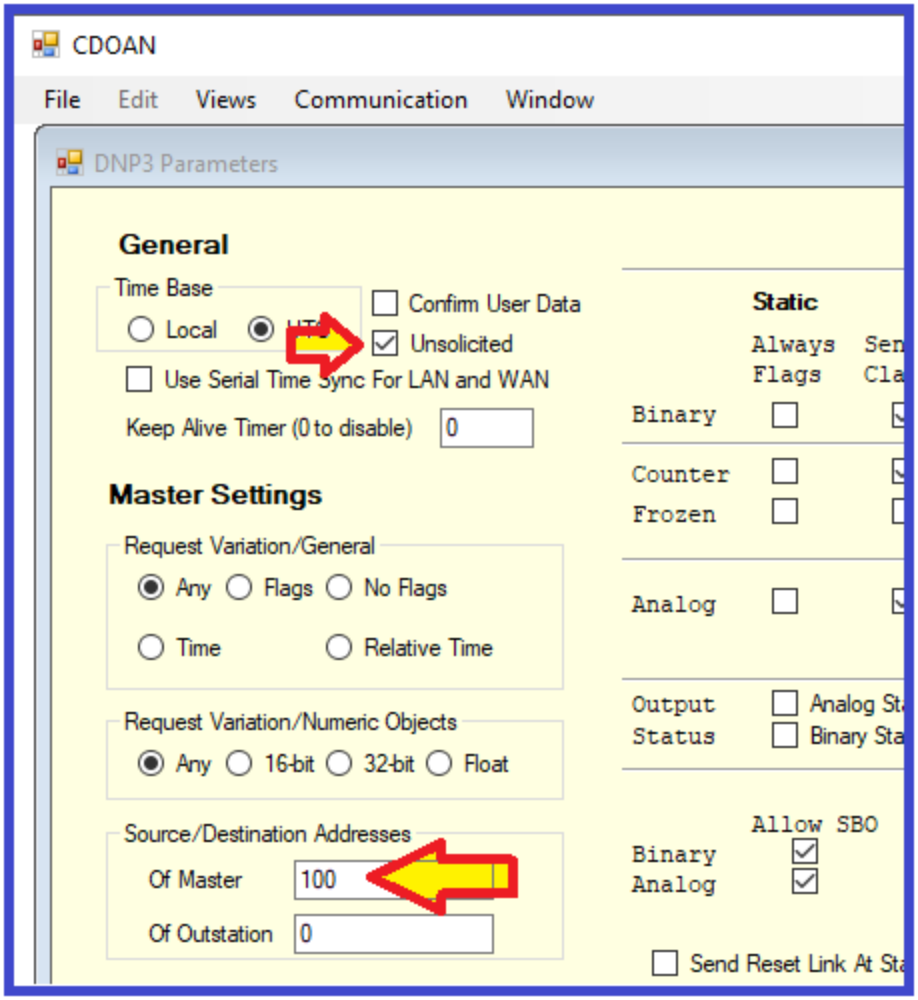
Setup

CDOAN-DNP3 follows published IEEE 1815 rules when operating as an outstation in unsolicited mode. If connected to an external master, that master must also follow these rules to establish unsolicited communication. This document describes the process followed by a CDOAN-DNP3 outstation and requirements of the master. It also assumes that the outstation is operating with TCP and not in dual-endpoint mode. Considerations for these options are described at the end of this document.

Before we start, go to the DNP3 Parameters view and:

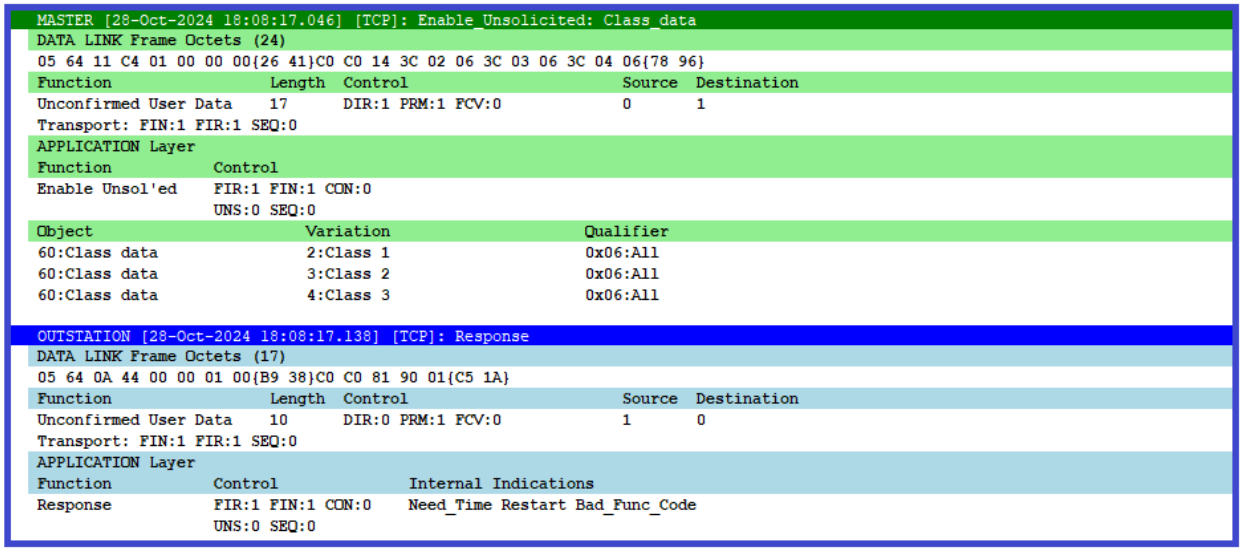
- Enabled unsolicited reporting
- Enter the DNP3 address of the master to which you will be communicating. Some masters ignore their DNP3 address and transmit messages with a source address of 0. This is OK, but you need to enter '0' in this case.



Operation at Startup

The following steps are followed when communication as an outstation is started:

1. If operating in a TCP network and not in dual-endpoint mode, CDOAN-DNP3 waits for a connection from the master.
2. Once a connection is received, or immediately when operating over a serial line, CDOAN-DNP3 sends a null unsolicited message to the master using the address entered above. This message is repeated periodically until confirmed by the master.
3. Once a confirmation is received, CDOAN-DNP3 disables all further unsolicited reporting.
4. The master is now expected to start its outstation initialization sequence including a poll of all input objects.
5. Once the poll is finished, the master can enable an unsolicited session by sending an “Enable Unsolicited” message containing a list of event classes. Typically, this message includes classes 1, 2, and 3.



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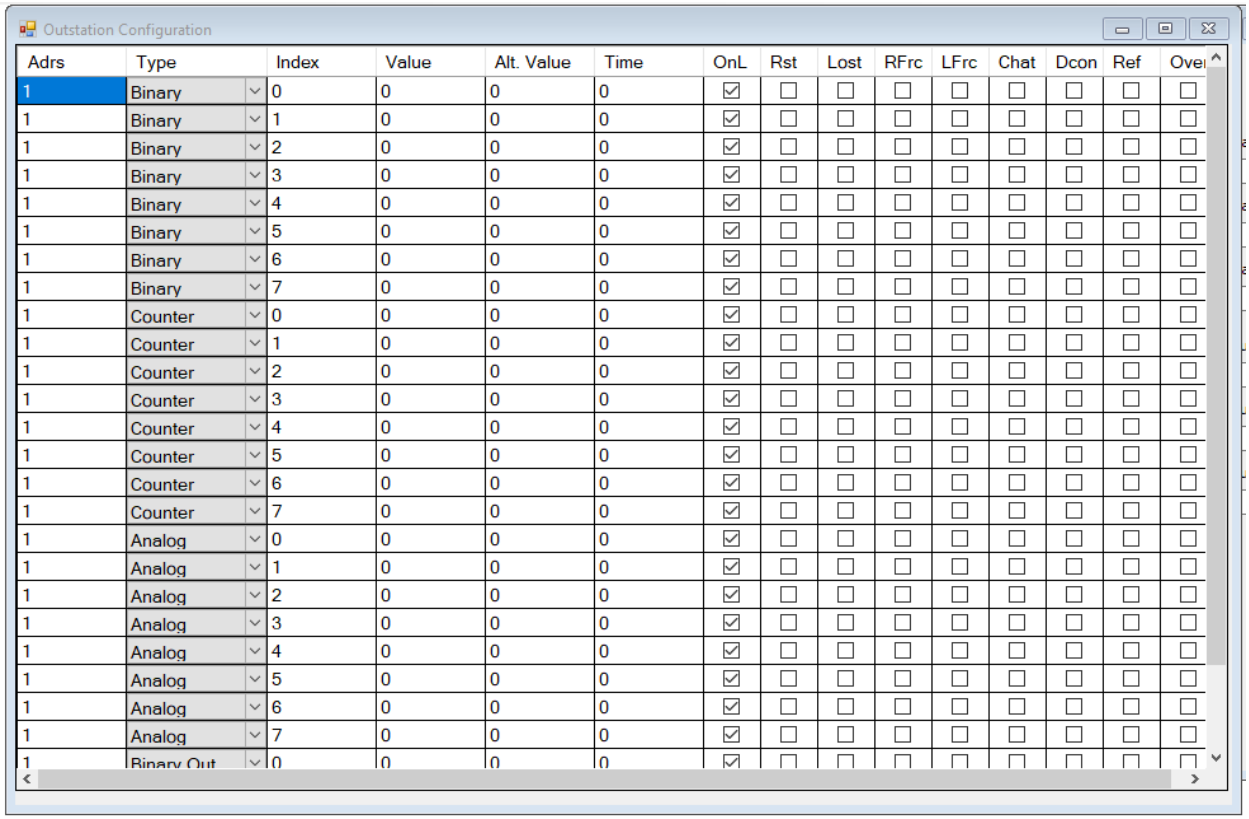
MASTER [28-Oct-2024 18:08:17.046] [TCP]: Enable_Unsolicited: Class_data
DATA LINK Frame Octets (24)
05 64 11 C4 01 00 00 00{26 41}C0 C0 14 3C 02 06 3C 03 06 3C 04 06{78 96}
Function                Length  Control                     Source  Destination
Unconfirmed User Data   17      DIR:1 PRM:1 FCV:0           0       1
Transport: FIN:1 FIR:1 SEQ:0
APPLICATION Layer
Function          Control
Enable Unsol'ed   FIR:1 FIN:1 CON:0
                  UNS:0 SEQ:0
Object                  Variation               Qualifier
60:Class data           2:Class 1               0x06:All
60:Class data           3:Class 2               0x06:All
60:Class data           4:Class 3               0x06:All

OUTSTATION [28-Oct-2024 18:08:17.138] [TCP]: Response
DATA LINK Frame Octets (17)
05 64 0A 44 00 00 01 00{B9 38}C0 C0 81 90 01{C5 1A}
Function                Length  Control                     Source  Destination
Unconfirmed User Data   10      DIR:0 PRM:1 FCV:0           1       0
Transport: FIN:1 FIR:1 SEQ:0
APPLICATION Layer
Function          Control             Internal Indications
Response          FIR:1 FIN:1 CON:0   Need_Time Restart Bad_Func_Code
                  UNS:0 SEQ:0
```

6. When this message is received and confirmed by the CDOAN-DNP3 outstation, unsolicited reporting of point changes starts. No unsolicited data can be sent by an outstation before this message is sent by the master.

Data Reporting

Even after unsolicited reporting is enabled, the outstation must still generate point changes so it has something to report. This is done from the *Outstation* view, which contains a list of points supported by the outstation. The easiest way to create a point list is to select the *Configure Sample Outstation* button from the *Config* view. If you do, then a sample outstation points list is created as shown.



Adrs	Type	Index	Value	Alt. Value	Time	OnL	Rst	Lost	RFrc	LFrc	Chat	Dcon	Ref	Over
1	Binary	0	0	0	0	☑	☐	☐	☐	☐	☐	☐	☐	☐
1	Binary	1	0	0	0	☑	☐	☐	☐	☐	☐	☐	☐	☐
1	Binary	2	0	0	0	☑	☐	☐	☐	☐	☐	☐	☐	☐
1	Binary	3	0	0	0	☑	☐	☐	☐	☐	☐	☐	☐	☐
1	Binary	4	0	0	0	☑	☐	☐	☐	☐	☐	☐	☐	☐
1	Binary	5	0	0	0	☑	☐	☐	☐	☐	☐	☐	☐	☐
1	Binary	6	0	0	0	☑	☐	☐	☐	☐	☐	☐	☐	☐
1	Binary	7	0	0	0	☑	☐	☐	☐	☐	☐	☐	☐	☐
1	Counter	0	0	0	0	☑	☐	☐	☐	☐	☐	☐	☐	☐
1	Counter	1	0	0	0	☑	☐	☐	☐	☐	☐	☐	☐	☐
1	Counter	2	0	0	0	☑	☐	☐	☐	☐	☐	☐	☐	☐
1	Counter	3	0	0	0	☑	☐	☐	☐	☐	☐	☐	☐	☐
1	Counter	4	0	0	0	☑	☐	☐	☐	☐	☐	☐	☐	☐
1	Counter	5	0	0	0	☑	☐	☐	☐	☐	☐	☐	☐	☐
1	Counter	6	0	0	0	☑	☐	☐	☐	☐	☐	☐	☐	☐
1	Counter	7	0	0	0	☑	☐	☐	☐	☐	☐	☐	☐	☐
1	Analog	0	0	0	0	☑	☐	☐	☐	☐	☐	☐	☐	☐
1	Analog	1	0	0	0	☑	☐	☐	☐	☐	☐	☐	☐	☐
1	Analog	2	0	0	0	☑	☐	☐	☐	☐	☐	☐	☐	☐
1	Analog	3	0	0	0	☑	☐	☐	☐	☐	☐	☐	☐	☐
1	Analog	4	0	0	0	☑	☐	☐	☐	☐	☐	☐	☐	☐
1	Analog	5	0	0	0	☑	☐	☐	☐	☐	☐	☐	☐	☐
1	Analog	6	0	0	0	☑	☐	☐	☐	☐	☐	☐	☐	☐
1	Analog	7	0	0	0	☑	☐	☐	☐	☐	☐	☐	☐	☐
1	Binary Out	0	0	0	0	☑	☐	☐	☐	☐	☐	☐	☐	☐

There are a few ways to use this view to generate point changes:

1. Enter a point value in the *Value* column, a different value in the *Alt. Value* column, and a time (seconds) in the *Time* column. The value assigned to the point will alternate between the two values at the time interval entered. An event will be generated if the values are different. Analog and counter values must differ by at least the deadband value entered from the DNP3 Parameters view.

2. Manually enter a new value in the value column. One change event is generated.

3. Check or uncheck any of the point's flag bits shown in the left nine columns. Flag changes always generate events. Note that these columns show all flags for all point types. Make sure you check an applicable flag. For example, "Overrange" applies to analogs only. Checking it for a binary input point will not generate an event.

Other Communication Options

- When operating in serial mode, enter a COM port number for communication to the master. The unsolicited null message is sent immediately on startup.

- When operating in UDP mode, either *UDP Only* or *TCP (UDP broadcast),* enter the IP address of the master in the *Config* view. The unsolicited message is sent as a UDP message at startup.

- When operating in dual-endpoint mode, enter the IP address of the master in the *Config* view. The outstation attempts to connect to the master at startup and sends an unsolicited message as soon as a connection is successful.