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Automation Network X-Change

AN-X-PBCAPT Module



The AN-X-PBCAPT module lets you capture, store and analyze network data on a Profibus network. Use it to examine the behavior of all drops, verify network data and timing, locate network errors and troubleshoot problems with the network and with the process.

The AN-X-PBCAPT module does not occupy a node on the network or affect existing network traffic in any way.

The AN-X-PBCAPT module:

- captures and stores ALL network frames, with timestamps to sub-microsecond precision
- uses post-capture filtering to select frames of interest for further analysis

This approach ensures that everything leading up to an event of interest is preserved. The alternative approach, pre-filtering and saving only certain messages, might cause you to lose key information.

There are two operating modes:

- continuous, captures all frames until stopped
- ring-buffer, preserves frames from a user-specified number of minutes before stopped. At the end of each minute, a new file is created and the file older than the keep time is deleted.

Capture file size depends on the baud rate and the amount of activity on the network. Typical values are 8 Mbytes/minute at a baud rate of 1.5Mbaud and 65 Mbytes/minute at a baud rate of 12Mbaud.

The AN-X-PBCAPT module is field upgradeable. The AN-X operating system and firmware can be upgraded over Ethernet.



Post-capture Filtering

The filtering is extremely flexible. For example, you can select frames:

- based on source or destination node
- to or from a specific SAP
- with errors
- by type, based on the frame control
- with specific data values

You create an equation that defines the criteria used to select frames of interest. The equation consists of data values and operators.

Data Values

Equations can contain the following data values:

- source and destination node address (SA and DA)
- frame status (STS)
- start delimiter type (SD)
- frame type (FC)
- source or destination SAP (SSAP and DSAP)
- frame data values (DataByte or DataWord)
- frame data length (Len)
- user parameters (CmdArg)
- constants, decimal or hexadecimal

Operators

Equations can contain the following operators :

<> != <= >= == = && AND || OR & | ^ * / % + - < > ! ~ ()

Example: This equation selects frames to or from node 17

(DA = 17) OR (SA = 17)

Example: This equation selects frames with errors

STS <> STSOK

Example: This equation selects frames based on a data value

DataWord[12] > 99

Captured Data

You can control how captured network frames appear, including:

- format of timestamps
- timing information – values and text graphs of time between frames and time from the start of one selected frame and the start of the next
- display of frame checksums
- detailed status information for frames

The following capture shows node 12 coming online and starting to exchange data with a master (node 0).

```
2888: a26.110,752,208 d 30,043 12<0 RFDL
2889: a26.110,782,604 d 0,029 0<12 OK
3040: a26.117,165,515 d 7,383 12<0 SRDH 60{62
3041: a26.117,215,521 d 0,049 0<12 DL 62{60 02 05 00 ff 08 57
3075: a26.119,217,878 d 2,002 12<0 SRDH 61{62 88 50 50 0b 08 75 00
3111: a26.121,192,757 d 1,974 12<0 SRDH 62{62 1f 1f 1f 19 2f 2f 2f 2f 2f 2f 2f
3145: a26.123,079,525 d 1,886 12<0 SRDH 60{62
3146: a26.123,128,531 d 0,049 0<12 DL 62{60 00 0c 00 00 08 57
3236: a26.128,386,693 d 5,258 12<0 SRDH 00 00 00 00 00 00 00 00 00 00 00 00
3237: a26.128,472,198 d 0,086 0<12 DL 00 00 00 00 00 00 00 00 00 00 00 00
3266: a26.130,319,904 d 1,847 12<0 SRDH 00 00 00 00 00 00 00 00 00 00 00 00
3267: a26.130,405,347 d 0,085 0<12 DL 00 00 00 00 00 00 00 00 00 00 00 00
3300: a26.132,400,601 d 1,994 12<0 SRDH 00 00 00 00 00 00 00 00 00 00 00 00
3301: a26.132,486,508 d 0,085 0<12 DL 00 00 00 00 00 00 00 00 00 00 00 00
3332: a26.134,433,943 d 1,946 12<0 SRDH 00 00 00 00 00 00 00 00 00 00 00 00
```

Each frame shown consists of :

- a reference number (3332 for the last frame)
- a timestamp (a26.134,433,943)
- time between frames (d 1946)
- destination and source nodes (12<0)
- frame control (SRDH)
- frame data

The frame with reference number 3146 shows destination and source SAPs (62{60)

The next capture show a frame with errors

```
1490: a14.240,409,635 sp..u...SD2 SD2 LE?(96) 68 66 66 68 00 63 08 00
```

The detailed status information shows that the frame has a start delimiter error, a parity error, and an underflow error.

Specifications

- Power requirements: 12 - 24 VDC, 4 watts typical
- Dimensions: 107 mm X 126 mm x 34 mm (4.18" x 4.97" x 1.33"), not including connectors
- Desktop use or DIN mountable

Related Products

- AN-X-AMXCAPT – capture module for Reliance AutoMax DCSNet or remote I/O networks
- AN-X-PBSLV – multislave module for PROFIBUS

The AN-X Product Family

Automation Network X-change (AN-X) is a product family designed by Quest Technical Solutions as a flexible platform for connecting to and monitoring automation networks.

A computer or other device (PLC, etc.) connects to AN-X via Ethernet, using one of a number of supported protocols.

The AN-X hardware consists of two parts:

- the main board that contains the processor, RAM, FLASH memory, FPGA and Ethernet hardware. This board is common to all versions of AN-X.
- a network-specific daughterboard that contains the hardware required to access the automation network

QTS is continually adding support for other networks. Contact us for information on the availability of an AN-X module for your network.

About QTS

Quest Technical Solutions is a provider of industrial communication hardware and software. Quest employees have many years combined experience in developing industrial communications solutions.

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