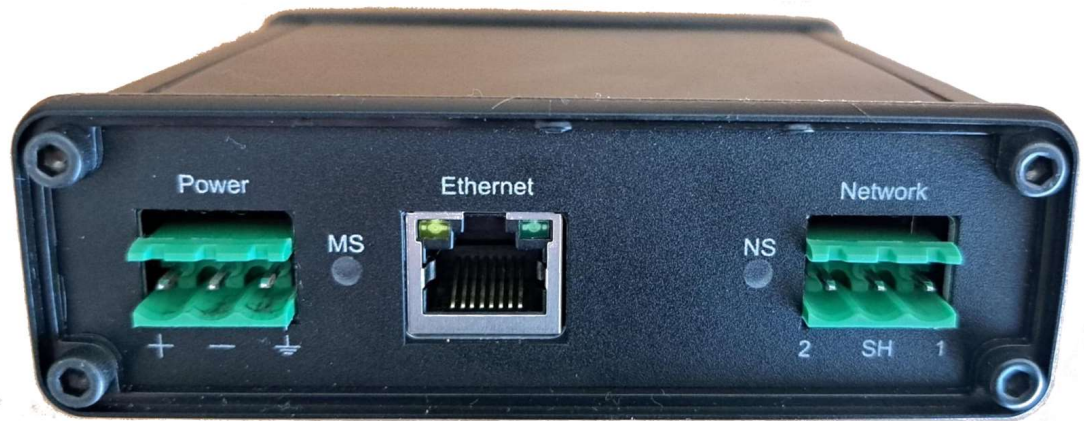


**Modbus TCP Operations
of the
AN-X-DHP Firmware
on the
AN-X4-AB-DHRIO Module**

User Manual



A product of Quest Technical Solutions

Sold and Supported by
ProSoft Technology Inc.
www.prosoft-technology.com



Introduction

Modbus TCP operations of the AN-X-DHP firmware on the AN-X4-AB-DHRIO module (referred to hereafter as AN-X) allows Modbus TCP clients to access PLC data on stations on a Data Highway Plus network.

Modbus TCP is available on AN-X-DHP firmware version 4.15.1 or above.

Operation

Modbus TCP mappings allow the AN-X to map Modbus TCP UnitID's to Data Highway Plus Stations.

Modbus Input Registers (3xxxx) and Holding Registers (4xxxx) are then mapped to PLC-5/SLC files for each station.

The Modbus TCP server supports up to 128 connections.

Modbus Commands Supported

03 (03H) Read Holding Registers	4xxxx
04 (04H) Read Input Registers	3xxxx
06 (06H) Write Single Register	4xxxx
16 (10H) Write Multiple Registers	4xxxx

MS (Module Status) LED

The MS LED is used by the AN-X operating system and software to indicate the state of operations and errors.

The AN-X-DHP Modbus TCP Server adds one additional MS LED error code.

Powerup/Reboot

MS LED	Meaning
RED/7	Modbus TCP server exited



Configuration

Modbus TCP is configured using a text file.

A sample Modbus TCP configuration is available on the 'Modbus TCP View' page.

This sample configuration documents the format and operation of the Modbus TCP server and shows several mapping examples.

```
; AN-X-DHP Modbus TCP
; Sample Configuration File
; This server supports up to 128 Modbus TCP connections

; Any radix can be overridden (0d decimal, 0o octal, 0x hex)

; UnitID [UnitID] [PLC TYPE] [Station]
; [UnitID]      - Modbus Unit ID - decimal (0-99)
; [PLC TYPE]   - PLC5 or SLC - PLC5 I and O file offsets octal
;              - SLC I and O file offsets decimal * See SLC I/O Mapping below
; [Station]    - DH+ Station - octal (0-77)

; UnitID [UnitID] [PLC TYPE] [Station]
UnitID 70 PLC5 70      ; UnitID 70 decimal mapped to a PLC-5 at Station 70 octal
UnitID 01 SLC 01      ; UnitID 1 decimal mapped to a SLC5/04 at Station 1 octal

; RegMap [UnitID] [ModbusReg] [AB Address]
; [UnitID]      - Modbus Unit ID - decimal (0-99)
; [ModbusReg]   - Modbus Register (30001-39999, 40001-49999, 300001-365536, 400001-465536)
; [AB Address]  - PLC5/SLC Address Range I,O,B,N,F[FileNum]:[FileOfs]-[LastOfs]

; RegMap [UnitID] [ModbusReg] [AB Address]
RegMap 70 400100 00:0-37      ; PLC-5 so O ofs is parsed as octal by default
RegMap 70 300100 I1:0-37      ; PLC-5 so I ofs is parsed as octal by default
RegMap 70 403000 B03:0-999    ;
RegMap 70 407000 N07:0-999    ;
RegMap 70 310000 N10:0-999    ; 3xxxxx Read Input Registers only
RegMap 70 408000 F8:0-499     ; F's are two regs long
RegMap 70 308000 F8:500-999   ; F's are two regs long (3xxxxx Read Input Registers only)

RegMap 01 300100 00:0-31      ; SLC so O ofs (Slot Num) is parsed as decimal by default
RegMap 01 301000 I1:0-31      ; SLC so I ofs (Slot Num) is parsed as decimal by default
RegMap 01 403000 B03:0-255    ;
RegMap 01 407000 N07:0-255    ;
RegMap 01 411000 N11:0-255    ;
RegMap 01 408000 F08:0-255    ; F's are two regs long

; * SLC I/O Mapping
; AN-X Modbus SLC I and O mappings specify the Module Slot Number in decimal, with
; Module Word Offset 0.
; I and O files must always be accessed starting at Word Offset 0, with whatever
; length is required.
; I and O data is consecutive and may be accessed as a block (multiple slots), but
; always starting at a valid Module Slot, with Module Word Offset 0.
```

Mapping

PLC-5/SLC Output files numbers are always 0.

PLC-5/SLC Input file numbers are always 1.

PLC5 I and O file offsets are octal by default.

SLC I and O file offsets are decimal by default.

All other file offsets and all file numbers are decimal by default.

Any radix can be overridden (0d decimal, 0o octal, 0x hex).

Multiple UnitID's can point to the same DH+ Station, but Modbus addresses from different UnitID's cannot overlap in this case.

Multiple Modbus addresses can map to the same PLC-5/SLC address.

Modbus commands 3 and 4 normally allow up to 125 registers but Data Highway Plus limits them to 122 or less, depending on the processor and the address.

Mapping to a 3xxxx address only supports read input registers (command 4).

Similarly, mapping to 4xxxx means that you have to use read holding registers (command 3) to read the data.

Modbus commands 6 (write single) and 16 (write multiple) can be used only with mappings to 4xxxx.

SLC Input and Output files

- mapped registers correspond to slots in the SLC rack
- map RegMap 2 300100 I1:0-30
 - 300100 -> slot 0
 - 300101 -> slot 1
 - 300102 -> slot 2
 - 300130 -> slot 30
- to read the I or O data for a module, use the starting register that corresponds to the slot, then read the number of input or output registers for the module in that slot
- example:


```
SLC config
slot 1  1746-NIO4V 2 words in, 2 words out
slot 2  1746-NIO4V 2 words in, 2 words out
slot 6  1746-NT4   8 words in, 8 words out

mapping
RegMap 02  300100- 300130 ->  SLC 01 I001:000-030

so 300100 -> slot 0
   300101 -> slot 1
   300102 -> slot 2
   ...
   300106 -> slot 6
```
- to get the 2 input words from slot 1, read 2 registers from 300101
- to get the 2 input words from slot 2, read 2 registers from 300102
- to get the 8 input words from slot 6, read 8 registers from 300106

