Industrial Protocols User's Guide

ETHERLINE ACCESS M05T/M08T

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Industrial Protocols User's Guide

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Introduction

MODBUS TCP is a protocol commonly used for the integration of a SCADA system. It is also a vendorneutral communication protocol used to monitor and control industrial automation equipment such as PLCs, sensors, and meters. In order to be fully integrated into industrial systems, LAPP's switches support Modbus TCP/IP protocol for real-time monitoring in a SCADA system.

Data Format and Function Code

MODBUS TCP supports different types of data format for reading. The primary four types of them are:

Data Access T	уре	Function Code	Function Name	Note
Bit access	Physical Discrete Inputs	2	Read Discrete Inputs	
	Internal Bits or Physical Coils	1	Read Coils	
Word access	Physical Input Registers	4	Read Input Registers	LAPP Support
(16-bit access)	Physical Output Registers	3	Read Holding Registers	

LAPP switches support Function Code 4 with 16-bit (2-word) data access for read-only information.

Configuring MODBUS/TCP on LAPP Switches

Modbus TCP



Activate

Select the checkbox and click **Activate** to enable the Modbus TCP.

MODBUS Data Map and Information Interpretation of LAPP Switches

The data map addresses of LAPP switches shown in the following table start from **MODBUS address 30001** for Function Code 4. For example, the address offset 0x0000 (hex) equals MODBUS address 30001, and the address offset 0x0010 (hex) equals MODBUS address 30017. Note that all the information read from LAPP switches are in hex mode. To interpret the information, refer to the ASCII table for the translation (e.g. 0x4D = M', 0x6F = o').

System Information System Information 0x0000 1 word HEX Vendor ID = 0x1393 0x0001 1 word Unit ID (Ethernet = 1) 0x0002 1 word HEX Product Code = 0x0003 0x0010 20 words ASCII Vendor Name = "LAPP Group" 0x0010 20 words ASCII Word 0 Lb byte = "Y 0x001 1 byte = 10' Word 1 Lb byte = "Y' Word 1 Lb byte = "Y' 0x0030 20 words ASCII Product Name = "ETHERLINE ACCESS MO8T" 0x0030 20 words ASCII Product Name = "ETHERLINE ACCESS M08T" 0x0030 20 words ASCII Product Name = "ETHERLINE ACCESS M08T" 0x0031 20 words ASCII Product Name = "ETHERLINE ACCESS M08T" 0x0032 20 words ASCII Product Name = "ETHERLINE ACCESS M08T" 0x0030 20 words ASCII Product Name = "ETHERLINE ACCESS M08T" 0x0031 20 words ASCII Word 1 Lb byte = "Y' 0x0032 20 words ASCII Word 1 Lb byte = T' 0x0033 20 word	Address Offset	Data Type	Interpretation	Description
0x0000 1 word HEX Vendor ID = 0x1393 0x0001 1 word Unit ID (Ethernet = 1) 0x0010 20 words ASCII Vendor Name = "XAPP Group" 0x0010 20 words ASCII Vendor Name = "XAPP Group" 0x0010 20 words ASCII Vendor Name = "TAPP Group" 0x010 20 words ASCII Word 0 Hi byte = 1' 0x01 1 L0 byte = 1' Word 1 L0 byte = 1' Word 2 L0 byte = 1' 0x01 1 L0 byte = 1' Word 3 L0 byte = 1' Word 3 L0 byte = 1' 0x0030 20 words ASCII Product Name = "ETHRLINE ACCESS MO8T" 0x0030 20 words ASCII Product Name = "THRLINE ACCESS MO8T" 0x0030 20 words ASCII Product Name = "THRLINE ACCESS MO8T" 0x004 1 L0 byte = 1' Word 1 L0 byte = 1' Word 1 L0 byte = 1' 0x0030 20 words ASCII Product Name = "THRLINE ACCESS MO8T" 0x004 1 L0 byte = 1' Word 1 L0 byte = 1' Word 2 L0 byte = 1' 0x010 1 L0 byte = 1' Word 1 L0 byte = 1' Word 3 L0 byte = 1' 0x01 1 L0 byte = 1	System Informat	ion		
0x0001 1 word HEX Vendor Code = 0x0003 0x0010 20 words ASCII Vendor Name = "LAPP Group" 0x010 20 words ASCII Word 0 to byte = "APP Group" 0x011 20 words ASCII Word 0 to byte = "APP Group" 0x001 20 words ASCII Word 1 to byte = "Y" 0x01 to byte = 0" Word 2 to byte = "Y" 0x01 to byte = "Y" Word 3 to byte = "Y" 0x01 20 words ASCII Product Name = "ETHERLINE ACCESS MO87" 0x0030 20 words ASCII Product Name = "ETHERLINE ACCESS MO87" 0x001 10 byte = "Y" Word 2 to byte = "Y" Word 3 to byte = "Y" 0x0030 20 words ASCII Product Name = "ETHERLINE ACCESS MO87" Word 4 to byte = "Y" Word 4 to byte = "Y" Word 3 to byte = "Y" 0x0030 20 words ASCII Word 4 to byte = "Y" Word 1 to byte = "Y" Word 1 to byte = "Y" Word 1 to byte = "Y" Word 3 to byte = "Y" Word 3 to byte = "Y" Word 3 to byte = "Y" Word 4 to byte = "Y	0x0000	1 word	HEX	Vendor ID = $0x1393$
0x0002 1 word HEX Product Cade = 0x0003 0x0010 20 words ASCII Vendor Name = 'LAP Group" 0x0010 20 words ASCII Word 0 Hi byte = 'L' 0x0010 20 words ASCII Word 0 Lib byte = 'L' 0x0010 20 words ASCII Word 2 Lib byte = 'L' 0x0010 20 words ASCII Word 3 Lib byte = 'C' 0x0030 20 words ASCII Product Name = 'ETHERLINE ACCESS MOBT" 0x0030 20 words ASCII Product Name = 'ETHERLINE ACCESS MOBT" 0x0030 20 words ASCII Product Name = 'ETHERLINE ACCESS MOBT" 0x0030 20 words ASCII Word 0 Hi byte = 'U' 0x0110 Dowd 1 Hib byte = 'U' Word 1 Lib byte = 'T' 0x0011 Word 2 Lib byte = 'L' Word 1 Lib byte = 'T' 0x011 Word 2 Lib byte = 'L' Word 2 Lib byte = 'L' 0x011 Word 3 Lib byte = 'Y' Word 3 Lib byte = 'Y' 0x011 Word 4 Lib byte = 'Y' Word 3 Lib byte = 'Y' 0x011 Lib byte = 'Y' Word 3	0x0001	1 word		Unit ID (Ethernet = 1)
0x0010 20 words ASCII Vendor Name = "LAPP Group" Word 0 lubyte = "V Word 0 lubyte = "Y Word 1 lubyte = "Y" Word 1 lubyte = "Y" Word 3 Hibyte = "Y" Word 3 Hibyte = "Y" Word 4 Hibyte = "Y" Word 4 Lubyte = "Y" Word 4 Lubyte = "Y" Word 4 Lubyte = "Y" Word 5 Lubyte = "Y" Word 4 Lubyte = "Y" Word 4 Lubyte = "Y" Word 6 Lubyte = "Y" Word 5 Lubyte = "Y" Word 6 Lubyte = "Y" Word 6 Lubyte = "Y" Word 6 Lubyte = "Y" Word 7 Lubyte = "Y" Word 6 Lubyte = "Y" Word 6 Lubyte = "Y" Word 6 Lubyte = "Y" Word 7 Lubyte = "Y" Word 6 Lubyte = "Y" Word 6 Lubyte = "Y" Word 6 Lubyte = "Y" Word 7 Lubyte = "Y" Word 6 Lubyte = "Y" Word 6 Lubyte = "Y" Word 6 Lubyte = "Y" Word 7 Lubyte = "Y" Word 6 Lubyte = "Y" Word 8 Lubyte = "Y" Word 6 Lubyte = "Y" Word 9 Lubyte = "Y" Word 6 Lubyte = "Y" Word 1 Lubyte = "Y" Word 6 Lubyte = "Y" Word 2 Lubyte = "Y" Word 6 Lubyte = "Y" Word 3 Lubyte = "Y" Word 6 Lubyte = "Y" Word 4 Lubyte = "Y" Word 6 Lubyte = "Y" Word 5 Lubyte = "Y" Word 6 Lubyte = "Y" Word 6 Lubyte = "Y" Word 1 Lubyte = "Y"	0x0002	1 word	HEX	Product Code = 0x0003
Initial Nord Hibste = T/ Word 0 Hibste = T/ Word 1 Hibste = T/ Word 2 Libste = C/ Word 3 Hibste = C/ Word 3 Libste = C/ Word 4 Libste = C/ Word 4 Libste = T/ Word 0 Hibste = T/ Word 1 Hibste = T/ Word 2 Libste = T/ Word 2 Libste = T/ Word 2 Libste = T/ Word 2 Hibste = T/ Word 2 Libste = T/ Word 2 Hibste = T/ Word 2 Hibste = T/ Word 3 Hibste = T/ Word 3 Hibste = T/ Word 6 Libste = T/ Word 6 Libste = T/ Word 7 Libste = T/ Word 7 Libste = T/ Word 6 Libste = T/ Word 6 Libste = T/ Word 7 Libste = T/ Word 6 Libste = T/ Word 6 Libste = T/ Word 7 Libste = T/ Word 7 Libste = T/ Word 6 Libste = T/ Word 6 Libste = T/ Word 7 Libste = T/ Word 7 Libste = T/ Word 6 Libste = T/ Word 7 Libste = T/ Word 7 Libste = T/ Word 7 Libste = T/ Word 8 Libste = T/ Word 1 Libste = T/ Word 0 Libste = T/ Word 1 Libste = T/ Word 2 Libste = T/ Word 1 Libste = T/ Word 2 Libste = T/ Word 1 Libste = T/ Wo	0x0010	20 words	ASCII	Vendor Name = "LAPP Group"
word 0 Lo byte = X' Word 1 H byte = 'P' Word 2 Lo byte = 'P' Word 3 H byte = 'V' Word 4 H byte = 'V' Word 3 Lo byte = 'C' Word 4 H byte = 'V' Word 4 Lo byte = 'P' Word 4 Lo byte = 'P' Word 4 Lo byte = 'P' Word 5 Lo byte = 'V' Word 6 Lo byte = 'P' Word 6 Lo byte = 'P' Word 7 Lo byte = 'P' Word 6 Lo byte = 'P' Word 7 Lo byte = 'P' Word 6 Lo byte = 'P' Word 7 Lo byte = 'P' Word 6 Lo byte = 'P' Word 7 Lo byte = 'P' Word 7 Libyte = 'P' Word 6 Lo byte = 'Y' Word 7 Hi byte = 'S' Word 7 Libyte = 'Y' Word 8 Libyte = 'Y' Word 9 Libyte = 'Y' Word 1 Libyte = 'Y' Word 2 Libyte = 'Y' Word 3 Libyte = 'Y' Word 4 Libyte = 'Y' Word 5 Libyte = 'Y' Word 6 Libyte = 'Y' Word 1 Libyte = 'Y'				Word 0 Hi byte = L'
word 1 Hi byte = 'P' Word 2 Lo byte = 'P' Word 2 Lo byte = 'G' Word 3 Lo byte = 'V' Word 3 Lo byte = 'U' 0x0030 20 words ASCII Product Name = 'E' Word 4 Lo byte = 'U' 0x0030 20 words ASCII Product Name = 'E' Word 0 Hi byte = 'U' 0x0030 20 words ASCII Product Name = 'E' Word 0 Lo byte = 'U' 0x0030 20 words ASCII Product Name = 'E' Word 0 Lo byte = 'U' 0x011 Hi byte = 'L' Word 1 Hi byte = 'H' 0x012 Ubyte = 'L' Word 2 Lo byte = 'L' 0x013 Lo byte = 'L' Word 3 Lo byte = 'L' 0x014 Lo byte = 'L' Word 3 Lo byte = 'L' 0x015 Hi byte = 'L' Word 5 Lo byte = 'L' 0x015 Lo byte = 'L' Word 5 Lo byte = 'L' 0x015 L word Product Serial Number 0x0051 2 words Firmware Release Date For example: Word 0 Lo byte = 'N' 0x0053 2 words HEX Firmware Release Date For example: Word 0 Lo byte = 0 x 000 Word 1 Lo byte = 0 x 000 Word 1 Lo byte = 0 x 000 Word 1 Lo byte = 0 x 00. 0x0055 3 words HEX Ethernet MAC Address Ex: MAC = 00-01-02-03-04-05 Word 0 Lo byte =				Word 0 to byte = 'A'
word 1 Lo Dyte = 'P' Word 2 Lo byte = '' Word 3 Hi byte = '' Word 3 Lo byte = '' Word 4 Lo byte = '' 0x0030 20 words ASCII Product Name = "ETHERLINE ACCESS MOBT" Word 4 Lo byte = P' 0x0030 20 words ASCII Product Name = ''ETHERLINE ACCESS MOBT" Word 0 Lo byte = 'P' 0x0031 20 words ASCII Product Name = ''ETHERLINE ACCESS MOBT" Word 0 Lo byte = 'P' 0x0031 20 words ASCII Word 0 Lo byte = 'P' 0x0032 20 words ASCII Word 1 Lo byte = 'P' 0x0033 20 words ASCII Word 2 Lo byte = 'P' 0x004 Lo byte = 'P' Word 2 Lo byte = 'L' Word 2 Lo byte = 'L' Word 2 Lo byte = 'L' Word 4 Lo byte = 'L' Word 5 Lo byte = 'L' Word 5 Lo byte = 'L' Word 5 Hi byte = 'Y' Word 6 Lo byte = 'S' Word 6 Lo byte = 'S' Word 7 Lo byte = 'S' Word 7 Hi byte = 'S' Word 9 Lo byte = 'Y' Word 8 Lo byte = 'Y' Word 9 Lo byte = 'Y' 0x0051 1 word Product Serial Number O'' Word 1 Lo byte = 'Y' 0x0053 2 words HEX Firmware Release Date For example: Word 0 Lo byte = 0 x 060 Word 1 Lo byte = 0 x 060 Word 1				Word 1 Hi byte = P'
word 2 Hi byte = '.' Word 3 Lo byte = 'G' Word 3 Lo byte = 'C' Word 4 Lo byte = 'U' 0x0030 20 words ASCII Product Name = "ETHERLINE ACCESS MOBT" Word 4 Lo byte = 'P' 0x0030 20 words ASCII Product Name = "ETHERLINE ACCESS MOBT" Word 0 Hi byte = 'F' 0x0010 20 words ASCII Product Name = "ETHERLINE ACCESS MOBT" Word 0 Lo byte = 'F' Word 1 Lo byte = 'F' Word 1 Lo byte = 'F' Word 1 Lo byte = 'F' Word 2 Lo byte = 'L' Word 3 Lo byte = 'N' Word 4 Lo byte = 'Y' Word 4 Lo byte = 'Y' Word 5 Lo byte = 'L' Word 6 Hi byte = 'Y' Word 6 Hi byte = 'S' Word 7 Lo byte = 'S' Word 7 Lo byte = 'S' Word 8 Hi byte = 'Y' Word 9 Lo byte = 'S' Word 9 Lo byte = 'S' Word 1 Lo byte = 'S' Word 9 Lo byte = 'S' Word 9 Lo byte = 'N' Word 9 Lo byte = 'N' Word 1 Lo byte = 'S' Word 1 Lo byte = 'N' Word 1 Lo byte = 'S' Word 1 Lo byte = 'N' Word 1 Lo byte = 'N' Word 0 Hi byte = 'N' Word 1 Lo byte = 'N' Word 1 Lo byte = 'N' Word 1 Lo byte = 'N' Word 1 Lo byte = 'N' Word 1 Lo byte = 'N'				Word 1 Lo byte = P'
word 2 Lo byte = 'G' Word 3 Li byte = 'N' Word 4 Hi byte = 'U' Word 4 Lo byte = 'U' Word 4 Lo byte = 'H' Word 0 Lo byte = 'H' Word 0 Lo byte = 'H' Word 0 Lo byte = 'H' Word 1 Lo byte = 'H' Word 1 Lo byte = 'Y' Word 3 Li byte = 'N' Word 2 Lo byte = 'Y' Word 3 Lo byte = 'N' Word 4 Li byte = 'Y' Word 4 Lo byte = 'Y' Word 5 Hi byte = 'Y' Word 5 Hi byte = 'Y' Word 5 Hi byte = 'Y' Word 6 Hi byte = 'Y' Word 6 Hi byte = 'Y' Word 7 Hi byte = 'S' Word 7 Hi byte = 'S' Word 7 Hi byte = 'S' Word 7 Hi byte = 'Y' Word 8 Lo byte = 'Y' Word 8 Lo byte = 'Y' Word 9 Lo byte = 'Y' Word 9 Lo byte = 'Y' Word 10 Lo byte = 'YO' Word 10 Lo byte = 'YO' Word 11 Lo byte = major (A) Word 0 Lo byte = major (A) Word 0 Lo byte = mior (B) Word 1 Lo byte = build (D) 0x0053 2 words HEX Firmware Version Word 0 = 0 x 0609 Word 1 Lo byte = build (D) 0x0055 3 words HEX Ethernet MAC Address Ex: MAC = 00-01-02-03-04-05 Word 1 Lo byte = 0 x 00 Word 0 Lo byte = 0 x 00 Word 0 Lo byte = 0 x 00 Word 1 Lo byte = 0 x 00 Word 0 Lo byte = 0 x 00 Word 1 Lo byte = 0 x 03 Word 2 Lo byte = 0 x 03 Word 2 Lo byte = 0 x 05				Word 2 Hi byte = $''$
word 3 hi byte = W word 3 Lo byte = O' Word 4 Hi byte = U' Word 4 Lo byte = P' 0x0030 20 words ASCII Product Name = "ETHERLINE ACCESS MO87" Word 0 Lo byte = T' Word 0 Lo byte = T' Word 1 Lo byte = T' Word 1 Lo byte = T' Word 2 Hi byte = R' Word 2 Li byte = T' Word 3 Li byte = T' Word 4 Hi byte = T' Word 4 Hi byte = Y' Word 4 Hi byte = Y' Word 5 Hi byte = Y' Word 5 Hi byte = Y' Word 6 Hi byte = C' Word 6 Hi byte = S' Word 7 Lo byte = S' Word 7 Lo byte = S' Word 8 Lo byte = S' Word 8 Lo byte = Y' Word 8 Lo byte = Y' word 6 Hi byte = Y' Word 6 Hi byte = S' Word 7 Lo byte = S' Word 1 Lo byte = S' Word 1 Lo byte = Y' 0x0050 1 word 0x0051 2 words Firmware Version Word 0 Hi byte = najor (A) Word 0 Hi byte = release Date For example: 0x0053 2 words HEX Etherme Release Date For example: Word 0 = 0 x0609 Word 1 = 0 x 0609 Word 1 = 0 x 0609 Word 1 = 0 x 0010-20-30-40-05 Word 0 Hi byte = 0 x 00 Word 0 Hi byte = 0 x 00 Word 0 Hi byte = 0 x 00 Word 1 Hi byte = 0 x 00 Word 2 Li byte = 0 x 04 Word 2 Li byte = 0 x 04 Word 2 Li byte = 0 x 05				Word 2 Lo byte = G'
Word 3 Lo byte = 'O' Word 4 Hi byte = 'U' Word 4 Lo byte = 'P' 0x0030 20 words ASCII Product Name = "ETHERLINE ACCESS MO8T" Word 0 Li byte = 'F' Word 0 Li byte = 'F' Word 1 Li byte = 'H' Word 1 Li byte = 'H' Word 1 Li byte = 'H' Word 3 Li byte = 'T' Word 3 Li byte = 'Y' Word 4 Li byte = 'Y' Word 4 Li byte = 'Y' Word 5 Li byte = 'Y' Word 6 Li byte = 'S' Word 7 Hi byte = 'S' Word 7 Hi byte = 'S' Word 8 Li byte = 'S' Word 9 Li byte = 'S' Word 9 Li byte = 'Y' Word 9 Li byte = 'Y' 0x0050 1 word Product Serial Number 0x0051 2 words Firmware Version Word 1 Hi byte = major (A) Word 0 Hi byte = major (A) Word 0 Hi byte = release Date Firmware kersion 0x0053 2 words HEX Ethermet MAC Address E:: MAC = 00-01-02-03-04-05 Word 0 Li byte = 0 x 00 Word 1 Li byte = 0 x 00 Word 2 Li byte = 0 x 03 Word 2 Li byte = 0 x 05				Word 3 Hi byte = 'R'
Word 4 It byte = 'U' 0x0030 20 words ASCII Product Name = "ETHERLINE ACCESS M087" Word 0 It byte = 'E' 0x0030 20 words ASCII Product Name = "ETHERLINE ACCESS M087" Word 0 It byte = 'T' 0x010 0 byte = 'E' Word 0 It byte = 'T' Word 1 It byte = 'T' Word 2 Lo byte = 'I' Word 3 Hi byte = 'Y' Word 3 Hi byte = 'Y' Word 4 Hi byte = 'Y' Word 3 Lo byte = 'Y' Word 5 Hi byte = 'Y' Word 4 Hi byte = 'Y' Word 5 Hi byte = 'Y' Word 6 Hi byte = 'Y' Word 6 Hi byte = 'Y' Word 6 Hi byte = 'S' Word 7 Lo byte = 'S' Word 7 Lo byte = 'S' Word 8 Lo byte = 'Y' Word 9 Lo byte = 'S' Word 9 Lo byte = 'N' Word 9 Lo byte = 'Y' Word 9 Lo byte = 'S' Word 10 Lo byte = 'Y' Word 9 Lo byte = 'S' Word 10 Lo byte = 'Y' Word 9 Lo byte = 'Y' Word 9 Lo byte = 'Y' 0x0051 2 words Firmware Version Word 0 Hi byte = release (C) Word 1 Hi byte = release (C) Word 1 Hi byte = 0 x 00? Word 1 = 0 x 00? Word 0 = 0 x 060? Word 1 = 0 x 00?				Word 3 Lo byte = O'
Word 4 Lo byte = 'P' 0x0030 20 words ASCII Product Name = "ETHERLINE ACCESS MO8T" Word 0 Hi byte = 'F' 0x0030 20 words ASCII Word 0 Lo byte = 'F' Word 1 Hi byte = 'F' Word 1 Hi byte = 'H' Word 2 Lo byte = 'Y' Word 2 Lo byte = 'Y' Word 3 Lo byte = 'Y' Word 4 Lo byte = 'Y' Word 4 Lo byte = 'Y' Word 4 Lo byte = 'Y' Word 4 Lo byte = 'Y' Word 5 Lo byte = 'Y' Word 6 Hi byte = 'Y' Word 6 Lo byte = 'Y' Word 4 Lo byte = 'Y' Word 6 Hi byte = 'Y' Word 6 Lo byte = 'Y' Word 5 Lo byte = 'Y' Word 6 Lo byte = 'Y' Word 6 Hi byte = 'Y' Word 6 Lo byte = 'Y' Word 7 Lo byte = 'S' Word 7 Lo byte = 'S' Word 7 Hi byte = 'Y' Word 8 Hi byte = 'Y' Word 9 Lo byte = 'Y' 0x0050 1 word Product Serial Number Product Serial Number 0x0051 2 words Firmware Version Word 0 Lo byte = major (A) Word 1 Hi byte = release C(C) Word 1 Hi byte = najor (A) Word 0 = 0 x 0609 Word 1 = 0 x 0705 Firmware Release Date For example: Word 0 = 0 x 0609 Word 1 =				Word 4 Hi byte = U'
0x0030 20 words ASCII Product Name = "ETHERLINE ACCESS MO8T" Word 0 Li byte = "I" Word 0 Li byte = "I" Word 1 Li byte = "I" Word 1 Li byte = "I" Word 2 Li byte = "I" Word 3 Li byte = "I" Word 3 Li byte = "I" Word 3 Li byte = "I" Word 4 Li byte = "I" Word 5 Li byte = "C" Word 5 Li byte = "C" Word 5 Li byte = "C" Word 6 Li byte = "C" Word 6 Li byte = "C" Word 7 Li byte = "S" Word 7 Li byte = "S" Word 7 Li byte = "S" Word 9 Li byte = "S" Word 10 Li byte = "S" Word 10 Li byte = "S" Word 10 Li byte = "Y" Word 10 Li byte = "S" Word 11 Li byte = "I" Word 11 Li byte = "S" Word 11 Li byte = "S" Word 11 Li byte = "S" Word 10 Li byte = "S" Word 11 Li byte = minor (B) Word 1 = 0 x 0609 Word 1 = 0 x 000 Word 0 Li byte = 0 x 00 Word 0 Li byte = 0 x 00 Word 0 Li byte = 0 x 00 Word 1 Li byte = 0 x 00 Word 1 Li byte = 0 x 01 Word 1 Li byte = 0 x 03 Word 2 Li byte = 0 x 04 Word 2 Li byte = 0 x 05				Word 4 Lo byte = P'
Word 0 Hi byte = 'E' Word 0 Lo byte = 'T' Word 1 Lo byte = 'Y' Word 1 Lo byte = 'E' Word 2 Lo byte = 'L' Word 3 Lo byte = 'L' Word 4 Lo byte = 'L' Word 5 Lo byte = 'L' Word 6 Lo byte = 'L' Word 6 Lo byte = 'L' Word 7 Hi byte = 'S' Word 7 Lo byte = 'S' Word 8 Lo byte = 'S' Word 9 Lo byte = 'S' Word 10 Hi byte = 'C' Word 9 Lo byte = 'S' Word 10 Hi byte = 'Y' Word 10 Lo byte = 'N' Word 10 Lo byte = 'O' Word 10 Lo byte = 'N' Word 0 Lo byte = 'N' Word 10 Lo byte = 'N' </td <td>0x0030</td> <td>20 words</td> <td>ASCII</td> <td>Product Name = "FTHERLINE ACCESS MO8T"</td>	0x0030	20 words	ASCII	Product Name = "FTHERLINE ACCESS MO8T"
Word 0 Lo byte = 'T' Word 1 Li byte = 'L' Word 1 Li byte = 'L' Word 2 Li byte = 'L' Word 3 Li byte = 'R' Word 4 Li byte = 'L' Word 4 Li byte = 'L' Word 5 Li byte = 'L' Word 6 Li byte = 'L' Word 6 Li byte = 'L' Word 7 Li byte = 'L' Word 6 Li byte = 'L' Word 6 Li byte = 'L' Word 7 Li byte = 'L' Word 6 Li byte = 'L' Word 7 Li byte = 'L' Word 8 Li byte = 'L' Word 9 Li byte = 'L' Word 10 Li byte =	0.0000	20		Word 0 Hi byte = F'
Word 1 Hibyte = 'H' Word 1 Lobyte = 'E' Word 2 Lobyte = 'L' Word 3 Lobyte = 'L' Word 4 Hibyte = 'R' Word 4 Hibyte = 'R' Word 5 Hibyte = 'Y' Word 6 Lobyte = 'V' Word 6 Lobyte = 'C' Word 7 Lobyte = 'C' Word 6 Lobyte = 'C' Word 7 Lobyte = 'S' Word 8 Hibyte = 'Y' Word 9 Hibyte = 'Y' Word 9 Libbyte = 'Y' Word 9 Libbyte = 'Y' Word 9 Libbyte = 'Y' Word 10 Libbyte = 'Y' Word 11 Libbyte				Word 0 to byte = T'
word 1 Lo byte = 'E' Word 2 Hi byte = 'R' Word 2 Hi byte = 'R' Word 2 Hi byte = 'R' Word 3 Lo byte = 'I' Word 3 Lo byte = 'Y Word 4 Lo byte = 'Y Word 5 Lo byte = 'Y Word 5 Lo byte = 'Y Word 6 Hi byte = 'Y Word 7 Hi byte = 'Y' Word 6 Hi byte = 'Y' Word 7 Hi byte = 'Y' Word 8 Lo byte = 'Y' Word 9 Lo byte = 'S' Word 9 Lo byte = 'Y' Word 1 Lo byte = 'Y'				Word 1 Hi byte = H'
word 2 Hi byte = 'R'. Word 2 Libyte = 'L'. Word 3 Libyte = 'L'. Word 3 Libyte = 'Y. Word 4 Hibyte = 'R'. Word 4 Libyte = 'N'. Word 5 Hibyte = 'N'. Word 5 Hibyte = 'Y. Word 6 Libyte = 'C'. Word 6 Hibyte = 'S'. Word 7 Libyte = 'S'. Word 7 Hibyte = 'S'. Word 7 Libyte = 'S'. Word 9 Hibyte = 'Y'. Word 9 Hibyte = 'S'. Word 10 Libyte = 'S'. Word 10 Libyte = 'S'. Word 10 Libyte = 'Y'. Word 2 Libyte = 'Y'. Word 10 Libyte = 'Y'. Word 10 Libyte = 'Y'. Word 11 Libyte = 0 X000 Word 1 Libyte = 0 X01 Word 1 Libyte = 0 X03				Word 1 Lo byte = F'
Word 2 Lo byte = 'L' Word 3 Hi byte = 'L' Word 3 Lo byte = 'N' Word 4 Lo byte = 'N' Word 4 Lo byte = 'N' Word 4 Lo byte = 'Y' Word 5 Lo byte = 'A' Word 5 Lo byte = 'C' Word 6 Lo byte = 'C' Word 6 Lo byte = 'C' Word 6 Lo byte = 'S' Word 7 Hi byte = 'S' Word 7 Hi byte = 'S' Word 8 Hi byte = 'Y' Word 9 Lo byte = 'S' Word 9 Lo byte = 'Y' Word 10 Lo byte = 'Y' Word 1 Lo byte = 'N' Word 1 Lo byte = build (D)0x00532 wordsHEXFirmware Release Date For example: Word 1 = 0 x 0705 Firmware was released on 2007-05-06 at 09 o'clock0x00553 wordsHEXEthernet MAC Address Ex: MAC = 00-01-02-03-04-05 Word 1 Hi byte = 0 x 00 Word 1 Lo byte = 0 x 01 Word 1 Hi byte = 0 x 02 Word 1 Hi byte = 0 x 02 Word 1 Hi byte = 0 x 04 Word 2 Li byte = 0 x 04 Word 2 Li byte = 0 x 05				Word 2 Hi byte = R'
Word 3 Hi byte = '1'Word 3 Lo byte = 'N'Word 4 Li byte = 'K'Word 4 Li byte = 'K'Word 4 Li byte = 'K'Word 5 Hi byte = 'A'Word 6 Li byte = 'C'Word 6 Li byte = 'C'Word 7 Li byte = 'S'Word 7 Li byte = 'S'Word 8 Li byte = 'N'Word 9 Li byte = 'S'Word 9 Li byte = 'N'Word 9 Li byte = 'N'Word 10 Hi byte = 'O'Word 10 Li byte = 'N'Word 10 Li byte = mior (B)Word 1 Li byte = najor (A)Word 1 Li byte = najor (A)Word 1 Li byte = lilid (D)0x00532 wordsHEXFirmware Release DateFor example:Word 1 = 0 x 0705Word 1 = 0 x 0705Firmware was released on 2007-05-06 at 09 o'clock0x00553 wordsHEXEthernet MAC Address Ex: MAC = 00-01-02-03-04-05 Word 1 Li byte = 0 x 00 Word 1 Li byte = 0 x 00 Word 1 Li byte = 0 x 01 Word 1 Li byte = 0 x 02 Word 1 Li byte = 0 x 04 Word 2 Li byte = 0 x 04 Word 2 Li byte = 0 x 04 Word 2 Li byte = 0 x 05				Word 2 to byte = $1'$
Word 3 Lo byte = 'N' Word 4 Hi byte = 'E' Word 4 Lo byte = '' Word 5 Hi byte = 'A' Word 5 Hi byte = 'C' Word 6 Hi byte = 'C' Word 7 Lo byte = 'S' Word 7 Lo byte = 'S' Word 7 Lo byte = 'S' Word 8 Hi byte = '' Word 9 Lo byte = 'S' Word 9 Lo byte = 'N' Word 10 Hi byte = 'Y' Word 10 Lo byte = 'N' Word 10 Lo byte = 'N' 0x0050 1 word 0x0051 2 words Firmware Version 0x0053 2 words HEX Firmware Release Date For example: Word 0 = 0 x005 Firmware was released on 2007-05-06 at 09 o'clock 0x0055 3 words HEX Ethernet MAC Address Ex: MAC = 00-01-02-03-04-05 Word 1 Hi byte = 0 x 00 Word 1 Hi byte = 0 x 00 Word 1 Hi byte = 0 x 01 Word 1 Hi byte = 0 x 02 Word 1 Hi byte = 0 x 03 Word 2 Hi byte = 0 x 05 0x0058 1 word				Word 3 Hi byte = I'
Word 4 Hi byte = 'E' Word 4 Lo byte = 'Y' Word 5 Hi byte = 'X' Word 5 Lo byte = 'C' Word 6 Lo byte = 'C' Word 6 Lo byte = 'C' Word 7 Hi byte = 'S' Word 8 Hi byte = '' Word 8 Hi byte = '' Word 9 Hi byte = '' Word 9 Hi byte = '' Word 9 Lo byte = 'S' Word 10 Hi byte = '' Word 10 Lo byte = 'S' Word 10 Lo byte = 'S' Word 10 Lo byte = 'N' Word 0 Lo byte = 'S' Word 10 Lo byte = 'N' Word 0 Lo byte = 'N' Word 0 Lo byte = minor (B) Word 1 Hi byte = release (C) Word 1 Lo byte = build (D)0x00532 wordsHEXFirmware Release Date For example: Word 1 = 0 x 0705 Firmware was released on 2007-05-06 at 09 o'clock0x00553 wordsHEXEthernet MAC Address Ex: MAC = 00-01-02-03-04-05 Word 0 Lo byte = 0 x 01 Word 1 Hi byte = 0 x 02 Word 1 Lo byte = 0 x 03 Word 2 Li byte = 0 x 03 Word 2 Li byte = 0 x 050x00581 wordHEXPower 1				Word 3 to byte = N'
Word 4 Lo byte = 'r' Word 5 Hi byte = 'X' Word 5 Hi byte = 'C' Word 6 Hi byte = 'C' Word 6 Hi byte = 'C' Word 6 Lo byte = 'E' Word 7 Lo byte = 'S' Word 7 Lo byte = 'S' Word 7 Lo byte = 'S' Word 8 Hi byte = '' Word 9 Hi byte = 'O' Word 9 Hi byte = 'O' Word 9 Hi byte = 'Y' Word 9 Hi byte = 'Y' Word 9 Lo byte = 'N' Word 10 Lo byte = 'Y' Word 1 Lo byte = 'Y' Word 1 Lo byte = build (D)0x00532 wordsHEXFirmware Release Date For example: Word 1 = 0 x 0705 Firmware was released on 2007-05-06 at 09 o'Clock0x00553 wordsHEXEthernet MAC Address Ex: MAC = 00-1-02-03-04-05 Word 1 Lo byte = 0 x 00 Word 1 Lo byte = 0 x 01 Word 1 Lo byte = 0 x 02 Word 1 Lo byte = 0 x 03 Word 2 Lo byte = 0 x 050x00581 wordHEXPower 1				Word 4 Hi byte = F'
Word 5 Hi byte = 'A' Word 5 Li byte = 'C' Word 6 Li byte = 'C' Word 6 Li byte = 'C' Word 7 Li byte = 'S' Word 7 Li byte = 'S' Word 8 Hi byte = 'Y' Word 9 Hi byte = 'Y' Word 9 Li byte = 'Y' Word 10 Li byte = 'Y' Word 10 Li byte = 'Y' Word 0 Hi byte = 'Y' Word 10 Li byte = 'Y' Word 10 Li byte = 'Y' Word 0 Hi byte = 'Y' Word 1 Li byte = 'Y' Word 1 = 0 x 0609 Word 1 = 0 x 0705 Firmware Release Date For example: Word 1 = 0 x 0705 Firmware was released on 2007-05-06 at 09 0'clock 0x0055 3 words HEX Ethernet MAC Address Ex: MAC = 00-01-02-03-04-05 Word 1 Li byte = 0 x 00 Word 1 Li				Word 4 I o byte = $''$
Word 5 Lo byte = 'C' Word 6 Li byte = 'C' Word 6 Li byte = 'C' Word 7 Hi byte = 'S' Word 7 Hi byte = 'S' Word 8 Li byte = 'Y' Word 9 Li byte = 'Y' Word 10 Li byte = 'Y' Word 11 Li byte = major (A) Word 1 Li byte = major (A) Word 1 Li byte = build (D) 0x0053 2 words HEX Firmware Release Date For example: Word 0 = 0 x 0609 Word 0 Hi byte = 0 x 005 Word 0 Hi byte = 0 x 00 Word 1 Li byte = 0 x 00 Word 1 Li byte = 0 x 01 Word 1 Li byte = 0 x 02 Word 1 Li byte = 0 x 03 Word 2 Li byte = 0 x 03<				Word 5 Hi byte = A'
Word 6 Hi byte = 'C'Word 6 Hi byte = 'C'Word 7 Hi byte = 'S'Word 7 Lo byte = 'S'Word 7 Lo byte = 'S'Word 8 Hi byte = 'Word 9 Hi byte = 'N'Word 9 Lo byte = 'N'Word 10 Lo byte = 'N'Word 10 Lo byte = 'Q'0x00501 word1 wordProduct Serial Number0x00512 words2 wordsFirmware Version Word 1 Lo byte = major (A) Word 1 Hi byte = release (C) Word 1 Hi byte = release (C) Word 1 Hi byte = release (C) Word 1 Hi byte = build (D)0x00532 words0x00553 wordsHEXFirmware Release Date For example: Word 0 = 0 x 0609 Word 1 = 0 x 0705 Firmware was released on 2007-05-06 at 09 o'clock0x00553 wordsHEXEthernet MAC Address Ex: MAC = 00-01-02-03-04-05 Word 0 Hi byte = 0 x 00 Word 1 Hi byte = 0 x 00 Word 1 Hi byte = 0 x 03 Word 2 Hi byte = 0 x 03 Word 2 Hi byte = 0 x 04 Word 2 Hi byte = 0 x 050x00581 word0x00581 word				Word 5 to byte = C'
Word 6 Lo byte = 'E' Word 7 Hoyte = 'S' Word 7 Lo byte = 'S' Word 8 Hibyte = '' Word 8 Lo byte = 'M' Word 9 Lo byte = 'N' Word 9 Lo byte = 'N' Word 9 Lo byte = 'N' Word 10 Hibyte = 'T' Word 10 Hibyte = 'Yo'0x00501 word0x00512 words2 wordsFirmware Version Word 1 Lo byte = 'No' Word 1 Lo byte = major (A) Word 1 Lo byte = release (C) Word 1 Lo byte = build (D)0x00532 words0x00553 words3 wordsHEXFirmware Release Date For example: Word 0 = 0 x 0609 Word 1 = 0 x 0705 Firmware was released on 2007-05-06 at 09 o'clock0x00551 word0x00551 word<				Word 6 Hi byte = C'
Word 7 Hi byte = 'S' Word 7 Lo byte = 'S' Word 8 Li byte = 'S' Word 8 Hi byte = 'I' Word 9 Hi byte = 'O' Word 9 Lo byte = 'N' Word 9 Lo byte = 'N' Word 9 Lo byte = 'N' Word 10 Hi byte = 'T' Word 10 Li byte = 'T' Word 10 Li byte = 'Y' Word 10 Li byte = 'Y' Word 0 Li byte = 'N' Word 0 Hi byte = major (A) Word 0 Lo byte = major (A) Word 0 Lo byte = major (B) Word 1 Hi byte = release (C) Word 1 Li byte = build (D)0x00532 wordsHEX0x00553 wordsHEXFirmware Release Date For example: Word 0 = 0 x 0609 Word 1 = 0 x 0705 Firmware was released on 2007-05-06 at 09 o'clock0x00553 wordsHEXEthernet MAC Address Ex: MAC = 00-01-02-03-04-05 Word 0 Li byte = 0 x 00 Word 1 Hi byte = 0 x 02 Word 1 Li byte = 0 x 03 Word 2 Li byte = 0 x 04 Word 2 Li byte = 0 x 050x00581 wordHEXProver 1				Word 6 Lo byte = E'
Word 7 Lo byte = 'S' Word 8 Hi byte = '' Word 8 Lo byte = 'M' Word 9 Lo byte = 'N' Word 9 Lo byte = 'N' Word 9 Lo byte = 'N' Word 10 Hi byte = 'T' Word 10 Lo byte = '\0'0x00501 wordProduct Serial Number0x00512 wordsFirmware Version Word 0 Hi byte = major (A) Word 0 Lo byte = minor (B) Word 1 Lo byte = build (D)0x00532 wordsHEX0x00553 wordsHEXFirmware Release Date For example: Word 0 = 0 x 0609 Word 1 = 0 x 0705 Firmware was released on 2007-05-06 at 09 o'clock0x00553 wordsHEXEthernet MAC Address Ex: MAC = 00-01-02-03-04-05 Word 0 Lo byte = 0 x 01 Word 1 Hi byte = 0 x 02 Word 1 Hi byte = 0 x 03 Word 2 Hi byte = 0 x 03 Word 2 Lo byte = 0 x 050x00581 wordHEX				Word 7 Hi byte = S'
Word 8 Hi byte = ``Word 8 Hi byte = ``Word 8 Lo byte = 'M'Word 9 Hi byte = 'O'Word 9 Lo byte = '8'Word 10 Hi byte = 'T'Word 10 Lo byte = '\0'0x00501 word2 wordsFirmware VersionWord 0 Lo byte = major (A)Word 0 Lo byte = major (A)Word 1 Lo byte = release (C)Word 1 Lo byte = build (D)0x00532 wordsHEXFirmware Release DateFor example:Word 0 = 0 x 0609Word 1 = 0 x 0705Firmware was released on 2007-05-06 at 09o'clock0x00553 wordsHEXEthernet MAC AddressEx: MAC = 00-01-02-03-04-05Word 1 Lo byte = 0 x 01Word 1 Lo byte = 0 x 03Word 2 Lo byte = 0 x 03Word 2 Hi byte = 0 x 04Word 2 Lo byte = 0 x 050x00581 wordHEX				Word 7 Lo byte = S'
Word 8 Lo byte = 'M' Word 9 Hi byte = 'O' Word 9 Lo byte = 'S' Word 10 Hi byte = 'O' Word 10 Lo byte = 'N' Word 10 Lo byte = 'N' Word 10 Lo byte = 'No'0x00501 wordProduct Serial Number0x00512 wordsFirmware Version Word 0 Lo byte = minor (B) Word 1 Lo byte = release (C) Word 1 Lo byte = build (D)0x00532 wordsHEX0x00553 wordsHEX0x00553 wordsHEXEthernet MAC Address Ex: MAC = 00-01-02-03-04-05 Word 0 Hi byte = 0 x 00 Word 1 Lo byte = 0 x 01 Word 1 Hi byte = 0 x 02 Word 1 Lo byte = 0 x 03 Word 2 Li byte = 0 x 03 Word 2 Hi byte = 0 x 050x00581 wordHEX				Word 8 Hi byte = $''$
Word 9 Hi byte = '0' Word 9 Lo byte = 'N' Word 10 Hi byte = 'T' Word 10 Lo byte = '\0'0x00501 word0x00512 words2 wordsFirmware Version Word 0 Hi byte = major (A) Word 0 Lo byte = minor (B) Word 1 Li byte = release (C) Word 1 Li byte = build (D)0x00532 words0x00553 words0x00553 words0x00553 words0x00551 word0x00551 word0x0055<				Word 8 Lo byte = M'
Word 9 Lo byte = '8' Word 10 Hi byte = 'T' Word 10 Lo byte = '\0'0x00501 wordProduct Serial Number0x00512 wordsFirmware Version Word 0 Hi byte = major (A) Word 0 Lo byte = minor (B) Word 1 Hi byte = release (C) Word 1 Lo byte = build (D)0x00532 wordsHEX0x00553 wordsHEX0x00553 wordsHEXEthernet MAC Address Ex: MAC = 00-01-02-03-04-05 Word 1 Lo byte = 0 x 00 Word 0 Lo byte = 0 x 01 Word 1 Li byte = 0 x 02 Word 1 Lo byte = 0 x 03 Word 1 Lo byte = 0 x 03 Word 2 Li byte = 0 x 04 Word 2 Li byte = 0 x 050x00581 wordHEX0x00581 wordHEX				Word 9 Hi byte = $0'$
Word 10 Hi byte = `T' Word 10 Lo byte = `\0'0x00501 wordProduct Serial Number0x00512 wordsFirmware Version Word 0 Hi byte = major (A) Word 0 Lo byte = minor (B) Word 1 Li byte = release (C) Word 1 Lo byte = build (D)0x00532 wordsHEX0x00553 wordsHEX0x00553 wordsHEX0x00581 wordHEX0x00581 wordHEX0x00581 word0x00581 wordHEX				Word 9 Lo byte = $8'$
Word 10 Lo byte = '\0'0x00501 wordProduct Serial Number0x00512 wordsFirmware Version Word 0 Hi byte = major (A) Word 0 Lo byte = minor (B) Word 1 Hi byte = release (C) Word 1 Lo byte = build (D)0x00532 wordsHEX0x00553 wordsHEX0x00553 wordsHEXEthernet MAC Address Ex: MAC = 00-01-02-03-04-05 Word 0 Hi byte = 0 x 00 Word 1 Hi byte = 0 x 00 Word 1 Hi byte = 0 x 03 Word 2 Lo byte = 0 x 050x00581 wordHEX				Word 10 Hi byte = T'
0x0050 1 word Product Serial Number 0x0051 2 words Firmware Version 0x0051 2 words Word 0 Hi byte = major (A) 0x00 0 Lo byte = minor (B) Word 1 Hi byte = release (C) 0x0053 2 words HEX Firmware Release Date For example: Word 0 = 0 x 0609 Word 1 = 0 x 0705 Firmware was released on 2007-05-06 at 09 o'clock 0x0055 3 words HEX Ethernet MAC Address Ex: MAC = 00-01-02-03-04-05 Word 0 Lo byte = 0 x 00 Word 0 Lo byte = 0 x 01 Word 1 Hi byte = 0 x 02 Word 1 Hi byte = 0 x 02 Word 1 Lo byte = 0 x 03 Word 2 Lo byte = 0 x 05 0x0058 1 word HEX				Word 10 Lo byte = $\sqrt{0'}$
0x00512 wordsFirmware Version Word 0 Hi byte = major (A) Word 0 Lo byte = minor (B) Word 1 Hi byte = release (C) Word 1 Lo byte = build (D)0x00532 wordsHEXFirmware Release Date For example: Word 0 = 0 x 0609 Word 1 = 0 x 0705 Firmware was released on 2007-05-06 at 09 o'clock0x00553 wordsHEXEthernet MAC Address Ex: MAC = 00-01-02-03-04-05 Word 0 Hi byte = 0 x 00 Word 0 Lo byte = 0 x 01 Word 1 Hi byte = 0 x 00 Word 1 Lo byte = 0 x 03 Word 2 Lo byte = 0 x 050x00581 wordHEXPower 1	0x0050	1 word		Product Serial Number
Word 0 Hi byte = major (A) Word 0 Lo byte = minor (B) Word 1 Hi byte = release (C) Word 1 Lo byte = build (D)0x00532 wordsHEXFirmware Release Date For example: Word 0 = 0 x 0609 Word 1 = 0 x 0705 Firmware was released on 2007-05-06 at 09 o'clock0x00553 wordsHEXEthernet MAC Address Ex: MAC = 00-01-02-03-04-05 Word 0 Hi byte = 0 x 00 Word 1 Hi byte = 0 x 00 Word 1 Hi byte = 0 x 02 Word 1 Lo byte = 0 x 03 Word 2 Hi byte = 0 x 04 Word 2 Lo byte = 0 x 050x00581 wordHEXPower 1	0x0051	2 words		Firmware Version
Word 0 Lo byte = minor (B) Word 1 Hi byte = release (C) Word 1 Lo byte = build (D)0x00532 wordsHEXFirmware Release Date For example: Word 0 = 0 x 0609 Word 1 = 0 x 0705 Firmware was released on 2007-05-06 at 09 o'clock0x00553 wordsHEXEthernet MAC Address Ex: MAC = 00-01-02-03-04-05 Word 0 Hi byte = 0 x 00 Word 1 Hi byte = 0 x 00 Word 1 Hi byte = 0 x 02 Word 1 Hi byte = 0 x 02 Word 1 Lo byte = 0 x 03 Word 2 Hi byte = 0 x 03 Word 2 Lo byte = 0 x 050x00581 wordHEXPower 1				Word 0 Hi byte = major (A)
Word 1 Hi byte = release (C) Word 1 Lo byte = build (D)0x00532 wordsHEXFirmware Release Date For example: Word 0 = 0 x 0609 Word 1 = 0 x 0705 Firmware was released on 2007-05-06 at 09 o'clock0x00553 wordsHEXEthernet MAC Address Ex: MAC = 00-01-02-03-04-05 Word 0 Hi byte = 0 x 00 Word 1 Hi byte = 0 x 00 Word 1 Hi byte = 0 x 02 Word 1 Lo byte = 0 x 03 Word 2 Hi byte = 0 x 04 Word 2 Lo byte = 0 x 050x00581 wordHEX				Word 0 Lo byte = minor (B)
Word 1 Lo byte = build (D)0x00532 wordsHEXFirmware Release Date For example: Word 0 = 0 x 0609 Word 1 = 0 x 0705 Firmware was released on 2007-05-06 at 09 o'clock0x00553 wordsHEXEthernet MAC Address Ex: MAC = 00-01-02-03-04-05 Word 0 Hi byte = 0 x 00 Word 1 Lo byte = 0 x 00 Word 1 Lo byte = 0 x 02 Word 1 Lo byte = 0 x 03 Word 2 Hi byte = 0 x 04 Word 2 Lo byte = 0 x 050x00581 wordHEX				Word 1 Hi byte = release (C)
0x00532 wordsHEXFirmware Release Date For example: Word 0 = 0 x 0609 Word 1 = 0 x 0705 Firmware was released on 2007-05-06 at 09 o'clock0x00553 wordsHEXEthernet MAC Address Ex: MAC = 00-01-02-03-04-05 Word 0 Hi byte = 0 x 00 Word 0 Lo byte = 0 x 01 Word 1 Lo byte = 0 x 02 Word 2 Hi byte = 0 x 03 Word 2 Hi byte = 0 x 050x00581 wordHEX				Word 1 Lo byte = build (D)
For example: Word 0 = 0 x 0609 Word 1 = 0 x 0705 Firmware was released on 2007-05-06 at 09 o'clock0x00553 wordsHEXEthernet MAC Address Ex: MAC = 00-01-02-03-04-05 Word 0 Hi byte = 0 x 00 Word 0 Lo byte = 0 x 01 Word 1 Hi byte = 0 x 02 Word 1 Lo byte = 0 x 03 Word 2 Hi byte = 0 x 04 Word 2 Lo byte = 0 x 050x00581 wordHEX	0x0053	2 words	HEX	Firmware Release Date
0x0055 3 words HEX Ethernet MAC Address Ex: MAC = 00-01-02-03-04-05 Word 0 Hi byte = 0 x 00 Word 0 Li byte = 0 x 00 Word 1 Li byte = 0 x 02 Word 1 Li byte = 0 x 02 Word 1 Li byte = 0 x 03 Word 2 Hi byte = 0 x 04 Word 2 Li byte = 0 x 05 0x0058 1 word HEX				For example:
0x0055 3 words HEX Ethernet MAC Address Ex: MAC = 00-01-02-03-04-05 Word 0 Hi byte = 0 x 00 Word 0 Lo byte = 0 x 01 Word 1 Hi byte = 0 x 02 Word 1 Lo byte = 0 x 02 Word 1 Lo byte = 0 x 03 Word 2 Hi byte = 0 x 04 Word 2 Lo byte = 0 x 05 0x0058 1 word HEX				Word $0 = 0 \times 0609$
Firmware was released on 2007-05-06 at 09 o'clock 0x0055 3 words HEX Ethernet MAC Address Ex: MAC = 00-01-02-03-04-05 Word 0 Hi byte = 0 x 00 Word 0 Lo byte = 0 x 01 Word 1 Hi byte = 0 x 02 Word 1 Lo byte = 0 x 03 Word 2 Hi byte = 0 x 04 Word 2 Lo byte = 0 x 05 0x0058 1 word				Word $1 = 0 \times 0705$
o'clock 0x0055 3 words HEX Ethernet MAC Address Ex: MAC = 00-01-02-03-04-05 Word 0 Hi byte = 0 x 00 Word 0 Lo byte = 0 x 01 Word 1 Hi byte = 0 x 02 Word 1 Lo byte = 0 x 02 Word 2 Hi byte = 0 x 03 Word 2 Hi byte = 0 x 04 Word 2 Lo byte = 0 x 05 0x0058 1 word				Firmware was released on 2007-05-06 at 09
0x0055 3 words HEX Ethernet MAC Address Ex: MAC = 00-01-02-03-04-05 Word 0 Hi byte = 0 x 00 Word 0 Lo byte = 0 x 01 Word 1 Hi byte = 0 x 02 Word 1 Lo byte = 0 x 03 Word 2 Hi byte = 0 x 04 Word 2 Lo byte = 0 x 05 0x0058 1 word HEX Power 1				o'clock
Ex: MAC = 00-01-02-03-04-05 Word 0 Hi byte = 0 x 00 Word 0 Lo byte = 0 x 01 Word 1 Hi byte = 0 x 02 Word 1 Lo byte = 0 x 03 Word 2 Hi byte = 0 x 04 Word 2 Lo byte = 0 x 05 0x0058 1 word HEX Power 1	0x0055	3 words	HEX	Ethernet MAC Address
Word 0 Hi byte = 0 x 00 Word 0 Lo byte = 0 x 01 Word 1 Hi byte = 0 x 02 Word 1 Lo byte = 0 x 03 Word 2 Hi byte = 0 x 04 Word 2 Lo byte = 0 x 05				Ex: MAC = 00-01-02-03-04-05
Word 0 Lo byte = 0 x 01 Word 1 Hi byte = 0 x 02 Word 1 Lo byte = 0 x 03 Word 2 Hi byte = 0 x 04 Word 2 Lo byte = 0 x 05				Word 0 Hi byte = 0×00
Word 1 Hi byte = 0×02 Word 1 Lo byte = 0×02 Word 1 Lo byte = 0×03 Word 2 Hi byte = 0×04 Word 2 Lo byte = 0×05 0x0058				Word 0 to byte = 0×01
Word 1 Lo byte = 0 x 03 Word 2 Hi byte = 0 x 04 Word 2 Lo byte = 0 x 05 0x0058 1 word				Word 1 Hi byte = 0×02
Word 2 Hi byte = 0 x 04 Word 2 Lo byte = 0 x 04 Word 2 Lo byte = 0 x 05 0x0058 1 word				Word 1 to byte = 0×03
Word 2 Lo byte = 0 x 05 0x0058 1 word HEX Power 1				Word 2 Hi byte = 0×04
0x0058 1 word HFX Power 1				Word 2 to byte = 0×05
	0x0058	1 word	HEX	Power 1

	Data Toma	T	Description
Address Offset	Data Type	Interpretation	
			0x0000: Off
	· .		0x0001: On
0x0059	1 word	HEX	Power 2
			0x0000: Off
			0x0001: On
0x005A	1 word	HEX	Fault LED Status
			0x0000: No
			0x0001: Yes
0x0080	1 word	HEX	DI1
			0x0000:Off
			0x0001:On
0x0081	1 word	HEX	DI2
			0x0000:Off
			0x0001:On
0x0082	1 word	HEX	D01
			0x0000:Off
			0x0001:On
0x0083	1 word	HEX	D02
			0x0000:Off
			0x0001:On
Port Information	1 <u> </u>		
0x1000 to	1 word	HEX	Port 1 to 8 Status
0x1011			0x0000: Link down
			0x0001: Link up
			0x0002: Disable
			0xFFFF: No port
0x1100 to	1 word	HEX	Port 1 to 8 Speed
0x1111			0x0000: 10M-Half
			0x0001: 10M-Full
			0x0002: 100M-Half
			0x0003: 100M-Full
			0xFFFF: No port
0x1200 to	1 word	HEX	Port 1 to 8 Flow Ctrl
0x1211			0x0000:Off
			0x0001:On
			0xFFFF:No port
0x1300 to	1 word	HEX	Port 1 to 8 MDI/MDIX
0x1311			0x0000: MDI
			0x0001: MDIX
			0xFFFF: No port
0x1400 to	20 words	ASCII	Port 1 to 8 Description
0x1413 (Port 1)			Port Description = "100TX,RJ45."
			Word 0 Hi byte = $1'$
0x1414 to			Word 0 Lo byte = $0'$
0x1427 (Port 2)			Word 1 Hi byte = $0'$
			Word 1 Lo byte = T'
			Word 4 Hi byte = '4'
			Word 4 Lo byte = $5'$
			Word 5 Hi byte = `.'
			Word 5 Lo byte = $10'$
Packets Informa	tion		
0x2000 to	2 words	HEX	Port 1 to 8 Tx Packets
0x2023			Ex: port 1 Tx Packet Amount = 44332211
			Received MODBUS response:
			0x44332211
			Word $0 = 4433$
			Word 1 = 2211
0x2100 to	2 words	HEX	Port 1 to 8 Rx Packets
0x2123			Ex: port 1 Rx Packet Amount = 44332211
			Received MODBUS response:
			0x44332211
			Word 0 = 4433
			Word 1 = 2211
0x2200 to	2 words	HEX	port 1 to 8 Tx Error Packets
0x2223			Ex: port 1 Tx Error Packet Amount = 44332211
			Received MODBUS response:
			0x44332211
			Word 0 = 4433
			Word 1 = 2211
0x2300 to	2 words	HEX	port 1 to 8 Rx Error Packets
0x2323			Ex: port 1 Rx Error Packet Amount = 44332211
h			

Address Offset	Data Type	Interpretation	Description
Address onsee	Butu Type		Pacoived MODBUS response:
			$W_{ard} 0 = 4433$
			Word $1 = 2211$
Pedundancy Infe	rmation		
		HEY	Redundancy Protocol
00000	1 Word	TIEX	
			0x0001.KSTP
			0x0002. Turbo Ring $1/2$
			0x0003.Turbo Kilig V2
0./2100	1		
0x3100	1 word	HEX.	RSTP ROOL
			UXUUUI: ROOL
0.0000	4		
0x3200 to	1 word	HEX	RSTP Port 1 to 8 Status
UX3211			UXUUUU: Port Disabled
			UXUUU1: NOT RSTP Port
			UXUUU2: LINK DOWN
			UXUUU3: Blocked
			0x0004: Learning
			0x0005: Forwarding
			0xFFFF: RSTP Not Enable
0x3300	1 word	HEX	TurboRing Master/Slave
			0x0000: Slave
			0x0001: Master
-			0xFFFF: Turbo Ring Not Enable
0x3301	1 word	HEX	TurboRing 1st Port status
			0x0000: Port Disabled
			0x0001: Not Redundant Port
			0x0002: Link Down
			0x0003: Blocked
			0x0004: Learning
			0x0005: Forwarding
0x3302	1 word	HEX	TurboRing 2nd Port status
			0x0000: Port Disabled
			0x0001: Not Redundant Port
			0x0002: Link Down
			0x0003: Blocked
			0x0004: Learning
			0x0005:Forwarding
0x3303	1 word	HEX	TurboRing Coupling
			0x0000: Off
			0x0001: On
			0xFFFF: Turbo Ring is Not Enabled
0x3304	1 word	HEX	TurboRing Coupling Port Status
			0x0000: Port Disabled
			0x0001: Not Coupling Port
			0x0002: Link Down
			0x0003: Blocked
			0x0005: Forwarding
			0xFFFF: Turbo Ring is Not Enabled
0x3305	1 word	HEX	TurboRing Coupling Control Port Status
			0x0000: Port Disabled
			0x0001: Not Coupling Port
			0x0002: Link Down
			0x0003: Blocked
			0x0005: Forwarding
			0x0006: Inactive
			0x0007:Active
			0xFFFF:Turbo Ring is Not Enabled
0x3500	1 word	HEX	TurboRing V2 Coupling Mode
		-	0x0000: None
			0x0001: Dual Homing
			0x0002: Coupling Backup
			0x0003: Coupling Primary
			0xFFFF:Turbo Ring V2 is Not Enabled
0x3501	1 word	HFX	TurboRing V2 Counting Port Primary Status
0,0001	1 1010		(Used in Dual Homing, Counting Backup, and
			Coupling Primary)
			0x0000 Port Disabled
			0x0001: Not Coupling Port
			OXOUUT. NOT COUPIIING POIL

	Data Tura	Testermentetion	Description
Address Offset	Data Type	Interpretation	Description
			0x0002: Link Down
			0x0003: Blocked
			0x0004: Learning
			0x0005: Forwarding
			0xFFFF: Turbo Ring V2 is Not Enabled
0,2502	1 word		TurboDing V2 Coupling Port Packup Status
0x3502	1 word	IL X	(Only using in Dual Homing)
			(Only using in Dual norming)
			0x0000. Poit Disabled
			0x0001. Not Coupling Port
			0x0002. LIIK DOWI
			0xEEEE: Turbo Ping V2 Not Enable
0x3600	1 word	HEY	TurboPing V2 Ping 1 status
0x3000	1 WOLU		0x0000: Healthy
			0×0001 : Break
			Overent Streak
0x3601	1 word	HEV	TurboPing V2 Ping 1 Master/Slavo
0,5001	IWOIU	TIEX	
			0x0000: Slave
			Overer: Turbo Ping V2 Ping 1 Not Enable
0,2602	1 word		Turbo Ring V2 Ring 1 Not Lindble
0x3002	1 word	HEX.	Ov0000, Port Disabled
			0x0000. Foil Disabled
			0x0001. Not Reduited to Fort
			0x0002: Elitik Dowit
			0x0004:Learning
			0x0005:Forwarding
0	1		UXFFFF: TUFDO RING V2 RING I IS NOL ENADIEU
0x3603	1 word	HEX	Turboking V2 king 1 s 2nd Port Status
			UXUUUU: Port Disabled
			0x0001: Not Redundant Port
			0x0002: Link Down
			0x0003: Blocked
			0x0004: Learning
			0x0005: Forwarding
0.000			UXFFFF: Turbo Ring V2 Ring 1 is Not Enabled
0x3680	1 word	HEX	TurboRing V2 Ring 2 Status
			0x0000: Healthy
			0x0001: Break
0.000			UXFFFF: Turbo Ring V2 Ring 2 is Not Enabled
0x3681	1 word	HEX	TurboRing V2 Ring 2 Master/Slave
			0x0000: Slave
			0x0001: Master
0.000			UXFFFF: Turbo Ring V2 Ring 2 is Not Enabled
0X3682	1 word	HEX	TurboRing V2 Ring 2's 1st Port Status
			UX0000: Port Disabled
			0x0001: Not Redundant
			UXUUU2: LINK DOWN
			0x0004: Learning
			0x0005: Forwarding
0.000			UXFFFF: Turbo Ring V2 Ring 2 is Not Enabled
0x3683	1 word	HEX	TurboRing V2 Ring 2's 2nd Port Status
			0x0000: Port Disabled
			0x0001: Not Redundant
			0x0002: Link Down
			0x0003: Blocked
			UXUUU4: Learning
			UXUUU5: Forwarding
			UXFFFF: Turbo Ring V2 Ring 2 is Not Enabled
0x3700	1 word	HEX	Turbo Chain Switch Roles
			0x0000: Head
			UXUUU1: Member
			UXFFFF: Turbo Chain is Not Enabled
0x3701	1 word	HEX	Iurbo Chain 1st Port status
			0x0000: Link Down
			0x0001: Blocking
			0x0002: Blocked
			0x0003: Forwarding

Address Offset	Data Type	Interpretation	Description
			0xFFFF: Turbo Ring V2 Ring 2 Not Enable
0x3702	1 word	HEX	Turbo Chain 2nd Port status
			0x0000: Link Down
			0x0001: Blocking
			0x0002: Blocked
			0x0003: Forwarding
			0xFFFF: Turbo Ring V2 Ring 2 Not Enable

Introduction

EtherNet/IP is an Industrial Ethernet Protocol defined by the ODVA association. The protocol is open to the public and vendors can implement EtherNet/IP into their industrial devices without incurring a license fee. Many vendors have adopted this protocol as the standard communication protocol between devices. For example, Rockwell Automation uses EtherNet/IP as the standard protocol for their Logix controllers over Ethernet networks.

To allow complete integration with a Rockwell system, LAPP switches not only provide a full-functioning of industrial network infrastructure, but also enable the SCADA system to monitor the status of the switches as well as that of the PLCs, .making the switches part of a Rockwell system.

Messaging Types

EtherNet/IP supports two types of communication methods for EtherNet/IP devices: Explicit Messaging and Implicit Messaging. Explicit Messaging is unscheduled and is used for a request/response communication procedure (or client/server procedure). Explicit Messaging uses TCP/IP over Ethernet. Implicit Messaging is scheduled and is used for a producer/consumer communication with UDP over Ethernet. Implicit Messaging is also called I/O Messaging.

Configuring EtherNet/IP on LAPP Switches

Ethernet/IP

- Enable
 Disable
 Activate
- (Enable IGMP Snooping automatically after activating)
- (Disable IGMP Snooping after activating)

Check the **Enable** checkbox to enable EtherNet/IP. With EtherNet/IP enabled, IGMP Snooping and IGMP Query functions will be enabled automatically to be properly integrated in Rockwell systems for multicast Implicit (I/O) Messaging.

CIP Objects of EtherNet/IP

Several communication objects are defined in CIP (Common Industrial Protocol). LAPP switches support the following objects for PLCs and SCADA systems to monitor:

• Identity Object

- TCP/IP Interface Object
- Ethernet Link Object
- Assembly Object
- Message Router Object
- Connection Manager Object
- Port Object
- LAPP Networking Object (Vendor Specific)

The supported attributes and services of the above objects are introduced in the table below, including the access rules for each attribute. To understand the details of each attribute of the standard objects, refer to the official documents of CIP introduction (Vol. 1) and the EtherNet/IP Adaptation of CIP (Vol. 2).

Identity Object

The Class code of Identity object is **0x01** (Defined in CIP Vol1, 5-2).

There is **one** instance of this object in our product. It stores the information of the production and the device. The following tables summarize the class attributes and the instance attributes.

Class Attribute List

Attr ID	Access Rule	Name	Data Type	Description
1	Get	Revision	UINT (16)	Revision of this object
2	Get	Max Instance	UINT (16)	Maximum instance number of an object currently created in this class level of the device
3	Get	Number of Instances	UINT (16)	Number of object instances currently created in this class level of the device.
6	Get	Maximum ID Number Class Attributes	UINT (16)	The attribute ID number of the last class attribute of the class definition implemented in the device
7	Get	Maximum ID Number Instance Attributes	UINT (16)	The attribute ID number of the last instance attribute of the class definition implemented in the device

Instance Attribute List

Attr ID	Access Rule	Name	(Struct.)	Data Type	Description
1	Get	Vendor ID		UINT (16)	991
2	Get	Device Type		UINT (16)	0 x 307, "Managed Ethernet Switch".
3	Get	Product Code		UINT (16)	Please refer to Product Code Table.
4	Get	Revision		(Struct.)	The version of the Identity object
			Major	USINT (8)	The structure member, major
			Minor	USINT (8)	The structure member, minor.
5	Get	Status		WORD (16)	Not used
6	Get	Serial Number		UDINT (32)	The serial number of each device
7	Get	Product Name		SHORT_ STRING	The product name in human-readable format
15	Get/Set	Assigned Name		STRINGI	The assigned switch name For example: "Managed Redundant Switch xxxxx". (xxxxx is series number.)
17	Get/Set	Geographic Location		STRINGI	The assigned switch location The default string is "Switch Location".

The Identity Object Instance supports the following CIP Common services:

Common Service List

Service	Implementation		Service Name	Description
Code	Class	Instance	1	
0x01	\checkmark	\checkmark	Get_Attributes_All	Returns the contents of all attributes of the class
0x0E	✓	\checkmark	Get_Attribute_Single	Used to read an object instance attribute.
0x10		\checkmark	Set_Attribute_Single	Used to write an object instance attribute
0x05	x05		Reset	Invokes the reset service for the device

Product Code Table

Product Code	Model Name
0x0006	ETHERLINE ACCESS M05T
0x0007	ETHERLINE ACCESS M08T

TCP/IP Interface Object

The Class code of TCP/IP Interface object is **0xf5** (Defined in CIP Vol2, 5-3).

There is $\ensuremath{\textbf{one}}$ instance of this object.

The following tables summarize the attributes of this object.

Attr ID	Access Rule	Name	Data Type	Description			
1	Get	Revision	UINT (16)	Revision of this object.			
2	Get	Max Instance	UINT (16)	Maximum instance number of an object currently created in this class level of the device			
3	Get	Number of Instances	UINT (16)	Number of object instances currently created at this class level of the device			
6	Get	Maximum ID Number Class Attributes	UINT (16)	The attribute ID number of the last class attribute of the class definition implemented in the device			
7	Get	Maximum ID Number Instance Attributes	UINT (16)	The attribute ID number of the last instance attribute of the class definition implemented in the device			

Class Attribute List

Instance Attribute List

Attr ID	Access Rule	Name	(Struct.)	Data Type	Description
1	Get	Status		DWORD (32)	Interface status
					0 = The Interface Configuration
					attribute has not been configured.
					1 = The Interface Configuration
					attribute contains valid
					configuration obtained from
					BOOTP, DHCP or non-volatile storage.
2	Get	Configurat		DWORD (32)	Interface capability flags
		ion			Bit map of capability flags:
		Capability			Bit 0: BOOTP Client
					Bit 1: DNS Client
					Bit 2: DHCP Client
					Bit 3: DHCP-DNS Update
-					Bit 4: Configuration Settable
3	Get/Set	Configurat		DWORD (32)	Interface control flags
		ION			Bit map of control flags:
		Control			Bit 0 to 3: Startup Configuration
					U = The device shall use the
					Interface configuration values
					previously stored (for example,
					witches)
					1 - The device shall obtain its
					interface configuration values via
					2 = The device shall obtain its
					interface configuration values via DHCP
					upon start-up
					3 to 15 = Reserved.
4	Get	Physical		(Struct.)	Path to physical link object
		Link	Path Size	UINT (16)	Size of Path
		Object	Path	Padded	Logical segments identifying the

				EPATH	physical link object
5	Get/Set	Interface Configurat		(Struct.)	TCP/IP network interface configuration
		ion	IP Address	UDINT (32)	The device's IP address
			Network Mask	UDINT (32)	The device's network mask
			Gateway Address	UDINT (32)	Default gateway address
			Name Server	UDINT (32)	Primary name server
			Name Server2	UDINT (32)	Secondary name server
			Domain Name	STRING	Default domain name
6	Get/Set	Host Name		STRING	Host name

The TCP/IP Object Instance supports the following CIP Common services:

Common Service List

Service	Service Implementation		Service Name	Description	
Code	Class	Instance			
0 x 01	\checkmark	\checkmark	Get_Attributes_All	Returns the contents of all attributes of the class	
0 x 0E	✓	\checkmark	Get_Attribute_Single	Used to read an object instance attribute	
0 x 10		\checkmark	Set_Attribute_Single	Used to modify an object instance attribute	

Ethernet Link Object

The Class code of Ethernet Link object is **0xf6** (Defined in CIP Vol2, 5-4). For each switch port, there is an instance of this class. The following table shows the mapping of instance number and the switch port number.

Instance Number	Mapping to	
0	Ethernet Link class	
1	1st switch port	
2	2nd switch port	
3	3rd switch port	

The following tables summarize the attributes of the Ethernet Link object.

There are some vendor specific attributes in the table (Starting from attribute Id 100).

Attr ID	Access Rule	Name	Data Type	Description
1	Get	Revision	UINT (16)	Revision of this object
2	Get	Max Instance	UINT (16)	Maximum instance number of an object currently created in this class level of the device
3	Get	Number of Instances	UINT (16)	Number of object instances currently created in this class level of the device
6	Get	Maximum ID Number Class Attributes	UINT (16)	The attribute ID number of the last class attribute of the class definition implemented in the device
7	Get	Maximum ID Number Instance Attributes	UINT (16)	The attribute ID number of the last instance attribute of the class definition implemented in the device
100	Get	LAPP-specific Revision	UINT (16)	Revision of LAPP specific attributes and services

Class Attribute List

Instance attribute list

Attr ID	Access Rule	Name	(Struct.)	Data Type	Description
1	Get	Interface Speed		UDINT (32)	Interface speed currently in use (Speed in Mbps, e.g., 0, 10, 100, 1000, etc.)
2	Get	Interface Flags		DWORD (32)	Refer to the Interface Flags table.
3	Get	Physical Address		ARRAY of 6 USINT(8)	MAC layer address (The System MAC address).
4	Get	Interface Counters		(Struct.)	Counters relevant to the receipt of packets.
			In Octets	UDINT (32)	Octets received on the interface.
			In Ucast Packets	UDINT (32)	Unicast packets received on the interface.
			In NUcast Packets	UDINT (32)	Non-unicast packets received on the interface.
			In Discards	UDINT (32)	Inbound packets received on the interface but are discarded.
			In Errors	UDINT (32)	Inbound packets that contain Errors (does not include In Discards).
			Out Octets	UDINT (32)	Octets sent on the interface.
			Out Ucast Packets	UDINT (32)	Unicast packets sent on the interface.
			Out NUcast Packets	UDINT (32)	Non-unicast packets sent on the interface.
			Out Discards	UDINT (32)	Discarded outbound packets.
			Out Errors	UDINT (32)	Outbound packets that contain errors.
5	Get	Media Counters		(Struct.)	
			Alignment Errors	UDINT (32)	Received frames that are not an integral number of octets in length.
			FCS Errors	UDINT (32)	Received frames that do not pass the FCS check.
			Single Collisions	UDINT (32)	Successfully transmitted frames which experienced exactly one collision.
			Multiple Collisions	UDINT (32)	Successfully transmitted frames which experienced more than one collision.
			SQE Test Errors	UDINT (32)	Number of times the SQE test error message is generated.

	1		Deferred		Frames for which first
			Transmissi		transmission attempt is delayed
			Late Collisions	UDINT (32)	Number of times a collision is detected later than 512 bit times into the transmission of a packet
			Excessive Collisions	UDINT (32)	Frames for which transmission fails due to excessive collisions.
			MAC Transmit Errors	UDINT (32)	Frames for which transmission fails due to an internal MAC sublaver transmit error.
			Carrier Sense Errors	UDINT (32)	Times that the carrier sense condition was lost or never asserted when attempting to transmit a frame.
			Frame Too Long	UDINT (32)	Received frames that exceed the maximum permitted frame size.
			MAC Receive Errors	UDINT (32)	Frames for which reception on an interface fails due to an internal MAC sublayer receive error.
6	Get/Set	Interface Control		(Struct.)	Configuration for physical interface.
			Control Bits	WORD (16)	Bit 0: Auto-Negotiate Value 0: Force Value 1: Auto-Nego Bit 1: Half/Full Duplex Value 0: half duplex Value 1: full duplex Bit 2 to 15: Reserved, all zero
			Forced Interface Speed	UINT (16)	Speed at which the interface shall be forced to operate.
10	Get	Interface Label		SHORT_STRING	Human readable identification
100	Get	Interface Port Index		UDINT (32)	Port index.
101	Get	Description		STRING	Port description.
102	Get/Set	Broadcast Storm Protection		USINT (8)	Value 0: Disabled Broadcast Storm Protection. Value 1: Enable Broadcast Storm Protection. (Only selected products support this function)
103	Get	Interface Utilization		USINT (8)	RX interface utilization in
104	Get/Set	Utilization Alarm Upper Threshold		USINT (8)	RX interface utilization upper limit in percentage
105	Get/Set	Utilization Alarm Lower Threshold		USINT (8)	Not supported
106	Get/Set	Port Link Alarm		USINT (8)	Value 0: Ignore Value 1: On (Relay 1) Value 2: On (Relay 2) Value 3: Off (Relay 1) Value 4: Off (Relay 2)
107	Get/Set	Port Traffic-Overload Alarm		USINT (8)	Value 0: Disable Value 1: Enable(Relay 1) Value 2: Enable(Relay 2)
108	Get	Tx Unicast Packet Rate		UDINT(32)	Number of TX unicast packets per second
109	Get	Rx Unicast Packet Rate		UDINT(32)	Number of RX unicast packets per second
110	Get	Tx Multicast Packet Rate		UDINT(32)	Number of TX multicast packets per second
111	Get	Rx Multicast Packet Rate		UDINT(32)	Number of RX multicast packets per second
112	Get	Tx Broadcast Packet Rate		UDINT(32)	Number of TX broadcast packets per second
113	Get	Rx Broadcast Packet		UDINT(32)	Number of RX broadcast packets

114	Get	Tx Multicast Packet	UDINT(32)	Total number of TX multicast
115	Get	Rx Multicast Packet	UDINT(32)	Total number of RX multicast packets
116	Get	Tx Broadcast Packet	UDINT(32)	Total number of TX broadcast packets
117	Get	Rx Broadcast Packet	UDINT(32)	Total number of RX broadcast packets
118	Get	Redundant Port Status	UDINT(32)	Bit 0 = Disable Bit 1 = Not Redundant port Bit 2 = Link down Bit 3 = Blocking Bit 4 = Learning Bit 5 = Forwarding

Interface Flags

Bit(s)	Called	Definition
0	Link Status	0 indicates an inactive link;
		1 indicates an active link.
1	Half/Full Duplex	0 indicates half duplex;
		1 indicates full duplex.
2-4	Negotiation Status	Indicates the status of link auto-negotiation
		0 = Auto-negotiation in progress.
		1 = Auto-negotiation and speed detection failed. Using default values
		for speed and duplex. Default values are product-dependent;
		recommended defaults are 10Mbps and half duplex.
		2 = Auto negotiation failed but detected speed. Duplex was defaulted.
		Default value is product-dependent; recommended default is half
		duplex.
		3 = Successfully negotiated speed and duplex.
		4 = Auto-negotiation not attempted. Forced speed and duplex.
5	Manual Setting Requires	0 indicates the interface can activate changes to link parameters
	Reset	(auto-negotiate, duplex mode, interface speed) automatically. 1
		indicates the device requires a Reset service be issued to its Identity
		Object in order for the changes to take effect.
6	Local Hardware	0 indicates the interface detects no local hardware fault; 1 indicates a
	Fault	local hardware fault is detected. The meaning of this is product-
		specific. For example, an AUI/MII interface might detect no
		transceiver attached, or a radio modem might detect no antenna
		attached. In contrast to the soft, possibly self-correcting nature of the
		Link Status being inactive, this is assumed a hard-fault requiring user
		intervention.
7~31	Reserved.	Shall be set to zero

The Ethernet Link Object Instance supports the following CIP common services:

Common Service List

Service Implementation		entation	Service Name	Description	
Code	Class	Instance			
0x0E	✓	\checkmark	Get_Attribute_Single	Used to read an object instance attribute	
0x10		\checkmark	Set_Attribute_Single	Used to modify an object instance attribute	

Assembly Object

The LAPP switch support **static** assembly object for CIP I/O messaging.

The Class code is **0x04** (Defined in CIP Vol 1, 5-5).

There are three instances of this object as the following.

	Instance Number	Size (32 bit)
Input	2	5
Output	1	2
Configuration	3	0

The **Input** means the data is produced by switch which includes the information and status report to the originator for monitoring. The **Output** means the data is generated by the originator (remote host) and is consumed by switch.

Class Attribute List

Attr ID	Access Rule	Name	Data Type	Description
1	Get	Revision	UINT (16)	Revision of this object

Instance Attribute List

Attr ID	Access Rule	Name	(Struct.)	Data Type	Description
3	Get/Set	Data		Array of BYTE	The implicit messaging content
4	Get	Size		UINT (16)	Number of bytes in Attr. 3

Common Service List

Service	Implementation		Service Name	Description
Code	Class	Instance		
0x0E	✓	\checkmark	Get_Attribute_Single	Used to read an object instance attribute
0x10		\checkmark	Set_Attribute_Single	Used to modify an object instance attribute

For the definition of the I/O messaging, see the following table for details.

I/O Messaging Content

Direction	I/O data	Size	Value & Description
Input	Switch Fault Status	UDINT (32)	Please refer to LAPP Networking Object Attr ID 2.
	Port Exist	ULINT (64)	Please refer to LAPP Networking Object Attr ID 4.
	Port Link Status	ULINT (64)	Please refer to LAPP Networking Object Attr ID 6.
Output	Port Enable	ULINT (64)	Please refer to LAPP Networking Object Attr ID 5.

Message Router Object

The object within a node that distributes messaging requests to the appropriate application objects.

The supported messaging connections are as the following:

- Explicit Messaging
- Unconnected Messaging
- Implicit messaging

When using the UCMM to establish an explicit messaging connection, the target application object is the Message Router object (Class Code **2**).

Class Attribute List

Attr ID	Access Rule	Name	Data Type	Descriptions
1	Get	Revision	UINT (16)	Revision of this object

Instance Attribute List

Attr ID	Access Rule	Name	(Struct.)	Data Type	Description
1	Get	Object_list		(Struct.)	A list of supported objects
			Number	UINT (16)	Number of supported classes in the classes array
			Classes	Array of UINT (16)	List of supported class codes
2	Get	Number Available		UINT (16)	Maximum number of connections supported
3	Get	Number Active		UINT (16)	Number of connections currently used by system components
4	Get	Active Connections		Array of UINT (16)	A list of the connection IDs of the currently active connections

Common Service List

Service	Implementation		Service Name	Description	
Code	Class	Instance			
0x0E		\checkmark	Get_Attribute_Single	Used to read an object instance attribute	

Connection Manager Object

The Connection Manager Class allocates and manages the internal resources associated with both I/O and Explicit Messaging connections.

The class code is **0x06**. There is one instance of this object.

The supported connection trigger type is *cyclic* and *change of state*.

The instance attribute list is introduced as the following.

Class Attribute List

Attr ID	Access Rule	Name	Data Type	Description
1	Get	Revision	UINT (16)	Revision of this object

Instance Attribute List

Attr ID	Access Rule	Name	Data Type	Description
1	Get/Set	Open Requests	UINT(16)	Number of Forward Open service requests received

Common Service List

Service	Implementation		Service Name	Description	
Code	Class	Instance			
0x0e	✓	\checkmark	Get_Attribute_Single	Returns the contents of the specified attribute	
0x10		\checkmark	Set_Attribute_Single	Used to modify an object instance attribute	
0x4E		✓	Forward_Close	Closes a connection	
0x54		\checkmark	Forward_Open	Opens a connection	

Port Object

The port object represents the underlying interface of CIP which is EtherNet/IP.

The class code is **0xf4**. There is one instance of this object.

The instance attribute "**Port Type**" identifies the CIP adaptation.

Class Attribute List

Attr ID	Access Rule	Name	(Struct.)	Data Type	Description
1	Get	Revision		UINT (16)	Revision of this object
2	Get	Max Instance		UINT (16)	Maximum instance number of an object currently created in this class level of the device
3	Get	Number of Instances		UINT (16)	Number of object instances currently created at this class level of the device.
8	Get	Entry Port		UINT (16)	The attribute ID number of the last class attribute of the class definition implemented in the device
9	Get	Port Instance Info		(Array of Struct.)	
			Port Type	UINT (16)	Enumerates the type of port
			Port Number	UINT (16)	CIP port number associated with this port

Instance Attribute List

Attr ID	Access Rule	Name	(Struct.)	Data Type	Description
1	Get	Port Type		UINT (16)	Enumerates the type of port. 4 = EtherNet/IP.
2	Get	Port Number		UINT (16)	CIP port number associated with this port. (Value 1 is reserved for internal product use)
3	Get	Link Object		(Struct.)	
			Path Length	UINT (16)	Number of 16 bit words in the following path.
			Link Path	Padded EPATH	Logical path segments that identify the object for this port.
4	Get	Port Name		SHORT_STR ING	String which names the physical network port. The maximum number of characters in

				the string is 64.
5	Get	Port Type Name	SHORT_STR ING	String which names the port type. The maximum number of characters in the string is 64.
6	Get/Set	Port Description	SHORT_STR ING	String which describes the port. The maximum number of characters in the string is 64.
7	Get	Node Address	Padded EPATH	Node number of this device on port. The range within this data type is restricted to a Port Segment.
9	Get	Port Key	Packed EPATH	Electronic key of network/chassis this port is attached to. This attribute shall be limited to format 4 of the Logical Electronic Key segment.

Common Service List

Service	Implem	entation	Service Name	Description
Code	Class	Instance		
0x0E	✓	\checkmark	Get_Attribute_Single	Used to read an object instance attribute
0x10		✓	Set_Attribute_Single	Used to modify an object instance attribute

LAPP Networking Object (Vendor Specific)

The LAPP Networking object includes system information and status.

It can also be used to do the device diagnostic & configuration through explicit messaging.

The class code is **0x404**.

Class Attribute List

Attr ID	Access Rule	Name	Data Type	Description
1	Get	Revision	UINT (16)	Revision of this object

Instance Attribute List

Attr ID	Access Rule	Name	Data Type	Description
1	Get	Firmware Version	UDINT (32)	Switch firmware version
2	Get	System Fault	UDINT (32)	Switch fault status
		Status		Bit 0: Reserved
				Value 0: Ok
				Value 1: Fail
				Bit 1: Reserved
				Value 0: Ok
				Value 1: Fail
				Bit 2: Port utilization alarm
				Value 0: No alarm
				Value 1: alarm
				Bit 3: Port link up
				Value 0: No alarm
				Value 1: Alarm
				Bit 4: Port link down
				Value 0: No alarm
				Value 1: Alarm
				Bit 5: Turbo ring break(Ring Master only)
				Value 0: No alarm
				Value 1: Alarm
				Bit 6: Power Input 1 fail
				Value 0: No alarm
				Value 1: Alarm
				Bit 7: Power Input 2 fail
				Value 0: No alarm
				Value 1: Alarm
				Bit 8:DI 1(off)
				Value 0: No alarm
				Value 1: Alarm
				Bit 9: DI 1(on)
				Value 0: No alarm
				Value 1: Alarm
				Bit 10: DI 2(off)
				Value 0: No alarm
	1			Value 1: Alarm

				Bit 11: DI 2(on)
				Value 0: No alarm
				Value 1: Alarm
				Bit 12: Reserved
				Value 0: Not support
				Value 1: Detected
				Bit 13: Power supply 1
				Value 0: Off
				Value 1:On
				Bit 14: Power supply 2
				Value 0: Off
				Value 1:On
				Bit 15~31: Reserved.
3	Get	Switch Port	USINT (8)	Switch max port number
		Number		
4	Get	Port Exist	ULINI (64)	switch per port exist
				Bit mask, the LSB indicates the first port.
				Value 1: Not exist
5	Cot/Sot	Dort Enable	$1 \parallel 1 \parallel T \parallel T \mid (64)$	Switch per pert epoble
5	Get/Set	FUILLIIADIE		Bit mask the LSB indicates the first port
				Value 0: Fnable
				Value 1: Disable
6	Get	Port Link Status	ULINT (64)	Switch per port link status
-			· · · · · · · · · · · · · · · · · · ·	Bit mask, the LSB indicates the first port.
				Value 0: Link down
				Value 1: Link up
7	Get/Set	IGMP Snooping	USINT (8)	IGMP snooping enable:
	-	Enable		Value 0: Disable
				Value 1: Enable
8	Get/Set	Query Interval	UDINT (32)	Query interval range from 20 to 600 secs
9	Get/Set	IGMP Enhanced	USINT (8)	IGMP enhanced mode
		Mode		0: Disable(default)
				1: Enable
14	Get/Set	Relay 1	USINT (8)	Override relay warning setting
				0: Disable(default)
4.5				1: Enable
15	Get/Set	Relay 2	USINI (8)	Override relay warning setting
				U: Disable (default)
16	Cat/Sat	Dowor 1 Dolov		1: Endble Dewer input 1 failure (an > off)
10	Get/Set	Power 1 Relay	051N1(8)	Power input 1 failure (on->oii)
		warning		1: Enable (relay 1)
				2: Enable (relay 2)
17	Get/Set	Power 2 Relay	LISINT (8)	Power input 2 failure (on->off)
17	000,000	Warning	001111 (0)	0: Disable (default)
		in a		1: Enable (relay 1)
				2: Enable (relay 2)
18	Get/Set	DI 1 (0ff)	USINT (8)	DI 1 (0ff)
		Relay Warning	. ,	0: Disable (default)
		, 5		1: Enable (relay 1)
				2: Enable (relay 2)
19	Get/Set	DI 1 (on)	USINT (8)	DI 1 (0n)
		Relay Warning		0: Disable (default)
				1: Enable (relay 1)
				2: Enable (relay 2)
20	Get/Set	DI 2 (0ff)	USINT (8)	DI 2 (Off)
		Relay Warning		0: Disable (default)
				1: Enable (relay 1)
24				2: Enable (relay 2)
21	Get/Set	DI 2 (on)	USINI (8)	
		Relay warning		U: Disable (default)
				1: Enable (relay 1)
22	Cot/Sot	Turbo Ding Brook		Z. Elidble (feidy Z) Turbo ring brook (Ding Master only)
22	Get/Set	Polay Warning	03101 (8)	C: Disable (default)
				1. Fnable (relay 1)
				2: Enable (relay 2)
23	Get	CPU Usage	USINT (8)	Percent of usage (0 to100)
24	Get	Device Un Time	UDINT (32)	Number of seconds since the device was powered up
25	Get/Set	Reset MIB Counts	USINT (8)	Reset port MIB counters.
26	Get	Redundant Device	UDINT (32)	Bit mask of device roles.
1-0		Mode	52 (52)	Bits 0= RSTP

				Bits 1= Turbo Ring Bits 2= Turbo Ring v2 Bits 3= Turbo Chain Bits 4= None
27	Get/Set	Reset Device	USINT (8)	Reboot and reset to default 1: Reboot the device 2: Reset to default

Common Service List

Service	Implem	entation	Service Name	Description
Code	Class	Instance		
0x0E	✓	\checkmark	Get_Attribute_Single	Used to read an object instance attribute
0x10		\checkmark	Set_Attribute_Single	Used to modify an object instance attribute

Electronic Data Sheet (EDS) File

The EDS (Electronic Data Sheet) file contains electronic descriptions of all relevant communication parameters and objects of an EtherNet/IP device. It is required for RSLogix 5000 to recognize LAPP switch and its CIP capability.

The list includes the sections which are described in our EDS file.

- [File]
- [Device]
- [Device Classification]
- [Port]

Icon should be 32 * 32 in pixel.

Rockwell RSLogix 5000 Add-On Instructions (AOI)

The Rockwell RSLogix 5000 Add-On Instructions (AOI) encapsulates LAPP switch supported EtherNet/IP functions in a common interface logic component. In RSLogix 5000 programming, users could use the AOI to communicate with LAPP switches and need not know the internal logic.

Our AOI would provide logic of LAPP switch configuration and monitoring by using EtherNet/IP in explicit messaging and implicit messaging. The AOI also provides some tags for RSLogix 5000/SCADA programming.

AOI Installation

To install the AOI, you must use Rockwell RSLogix 5000 version 20 or later and LAPP managed Ethernet switches with firmware version 3.0 or later.

The Five Major Stages of Installing the AOI

- 1. Add LAPP switch to the I/O configuration tree
- 2. Import the Add-On Instruction (AOI)
- 3. Add an instance of the AOI in your application
- 4. Create and configure tags for the AOI
- 5. Download the configured AOI to Rockwell PLC

Add LAPP switch to the I/O configuration tree

In order to import the AOI, the first step is to create a new Ethernet Module in RSLogix 5000.

1. Open RSLogix 5000 and create a new controller.

Click **Type** and select the Rockwell PLC model of the PLC connected to the LAPP switch. Input a **Name** and **Description** for this new controller.

lew Controller		×
Vendor:	Allen-Bradley	
Туре:	1769-L32E CompactLogix5332E Controller	• OK
Revision:	20 🗸	Cancel
	Redundancy Enabled	Help
Name:	ETHERLINE_ACCESS_M08T	
Description:	1	~
Chassis Type:	<pre></pre>	-
Slot:	0 Safety Partner Slot: <none></none>	
Create In:	C:\RSLogix 5000\Projects	Browse
Security Authority:	No Protection	•
	Use only the selected Security Authority for Authentication and Authorization	

 Add an Ethernet Module to the I/O Configuration.
 In the controller organizer window, select I/O Configuration, right click Ethernet under the PLC Ethernet port of the PLC connected to a LAPP switch, and select New Module.

🕄 RSLogix 5000 - ETHERLINE_ACCESS_M08T [1769-L32E 20.11]
File Edit View Search Logic Communications Tools Window Help
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Strings Add-On-Defined Predefined Trends JO Configuration Backplane, CompactLogix System To 1769-132E Ethernet Port LocalENB Recomp New Module New Module New Module
Discover Modules Paste Ctrl+V Print →

3. Under the **Communications** group, select **Generic Ethernet Module** to represent LAPP Ethernet switches

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1783-ETAP1F 3 Port E 1783-ETAP2F 3 Port E 1788-EN2DN 1788 EI 1788-ENET 1788 II 1794-AENT 1794 II 1794-AENT 1794 II 2706-PENETX In View CEP7-ETN CEP7-E Drivelogic/730 Ethernet 10/100	themet Tap, 1 Fiber/2 Twisted-Pair Media themet Tap, 2 Fiber/1 Twisted-Pair Media hemet to DeviceNet Linking Device	Allen-Bradley Allen-Bradley	Communication Communication
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1788-EN2DN 1788 EN 1788-ENET 1788 EN 1784-ENT 1784 IC 1794-AENT 1794 IC 1794-ENTR 1794 IC 2706-EENETX InView CEP7-ETN CEP7 Drivelogis/S730 Ethernet 10/100	hemet to DeviceNet Linking Device		
1788-ENBT 1788 10 1794-AENT 1794 10 1794-AENTR 1794 10 2706-PENETX InView CEP7-ETN CEP7 E DrivelogisS730 Ethemet 10/100	•	Allen-Bradley	Communication
1794-AENT 1794 10 1794-AENTR 1794 10 2706-PENETK InView CEP7-ETN CEP7 DrivelogieS730 Ethemet	/100 Mbps Ethernet Bridge, Twisted-Pair M	fedia Allen-Bradley	Communication
1794-AENTR 1794 10 2706-PENETX InView CEP7-ETN CEP7 E Drivelogix5730 Ethemet 10/100	/100 Mbps Ethernet Adapter, Twisted-Pair M	Media Allen-Bradley	Communication
2706-PENETX InView CEP7-ETN CEP7 E Drivelogix5730 Ethernet 10/100	/100 Mbps Ethernet Adapter, 2-Port, Twiste	ed-P Allen-Bradley	Communication
CEP7-ETN CEP7 E Drivelogix5730 Ethernet 10/100	EtherNet/IP	Allen-Bradley	Human-Machine I
Drivelogix5730 Ethernet 10/100	therNet/IP	Sprecher+Schuh	Motor Overload
	Mbps Ethernet Port on DriveLogix5730	Allen-Bradley	Communication
EtherNet/IP SoftLog	ix5800 EtherNet/IP	Allen-Bradley	Communication
ETHERNET-BRIDGE Generic	EtherNet/IP CIP Bridge	Allen-Bradley	Communication
ETHERNET-MODULE Generic	Ethernet Module	Allen-Bradley	Communication
ETHERNET-PANELVIEW EtherNe	t/IP Panelview	Allen-Bradley	HMI
ILX34-AENWG 1734W	ireless Ethernet Adapter, Twisted-Pair Media	a Prosoft Technol.	Communication
IND560 Ethernet/IP Scale Te	rminal	Mettler-Toledo	Communication
IND780 Ethernet/IP Scale Te	rminal	Mettler-Toledo	Communication
Promag_53 EtherNe	t/IP Electromagnetic Flow Meter	Endress+Hauser	Specialty
Promass_83 EtherNe	t/IP Mass Flow Meter	Endress+Hauser	Specialty
PSSCENA Etheme			Communication
•	Adapter, Twisted-Pair Media	Parker Hannifin	

4. Configure the Ethernet module with the correct name, description, IP address and connection parameters and click OK.

New Module							<u> </u>
Type: Vendor: Parent:	ETHERNET-MODULE Generic Allen-Bradley LocalENB	Ethernet	Module	meters			
Name: Description:	MORT			Assembly Instance:	Size:		
Description.	LAPP Group managed switch	^	Input:	2	5	🚔 (32-bit)	
		Ŧ	Output:	1	2	🚔 (32-bit)	
Comm Format:	Data - DINT	-	Configuration:	3	0	(8-bit)	
Address / H	ost Name						
IP Addre	ss: 192 . 168 . 127 . 25	53	Status Input:			_	
🔘 Host Nar	ne:		Status Output:				
🔽 Open Modu	le Properties		OK	Canc	el	Help]

5. After finishing configuration, the new Ethernet module representing the LAPP Ethernet switch will appear under the **I/O Configuration** list in the controller organizer window.



Import the Add-On Instruction (AOI)

- In the controller organizer window, right click the Add-On Instructions folder, select Import Add-On Instructions and select the correct AOI file (xxx.L5X) to import.
- **NOTE** The AOI file is available from the LAPP website. Please make sure to use the latest switch firmware and AOI for programming.



2. After importing, the controller organizer window shows all AOI for LAPP Ethernet switches under the **Add-On Instructions** folder.



Add an instance of the AOI in your application

1. Double click the **MainRoutine** in the Controller Organizer to start the ladder programming. Add the AOI for the specific LAPP Ethernet switch to create a new rung.



Create and configure tags for the AOI

1. Right click on the ? in the field of each tag, select **New Tag** and input a **Name** for each new tag.

			t	he AOI of LAPP switch	Н
				New Tag	
			ж	Cut Instruction	Ctrl+X
New Tag			1	<u>C</u> opy Instruction	Ctrl+C
Name:	aoi_M08T_instance	Create 🗸 🗸	i.	Paste	Ctrl+V
Description:				Delete Instruction	Del
Description.	*	Cancel		<u>A</u> dd Ladder Element	Alt+In
		Help		Edit Main Operand Description	Ctrl+D
_	-			Save Instruction Defaults	
-				Clear Instruction Defaults	
Type:	Connection			Remove Force	
Alias For:	~			Galla	Ctelu G
Data Type:	AOI_LAPP_SWITCH_v1_0_0			Instruction Help	F1
Scope:	B ETHERLINE_ALLESS_MU8T ▼	l	<u>≣</u> ∳ 36	Remove All Linknown Parameters	
External Access:	Read/Write 👻	4	37		
Style:				Open Instruction Logic	
Constant				Open Instruction Definition	
Constant			_	riopenes	AILTER

2. Add a Name for all AOI tags.



For "Switch_Input" and "Switch_Output", use the scrollbar to select the tag name

AOLLAPP_SWITCH_v1_0_0 the AOI of LAPP_SWITCH_v1_0_0 the AOI of LAPP_SWITCH_v1_0 aoi_M08T_instance Switch_nput M08T:LData Switch_nput M08T:LData Switch_noutput Switch_n	Switch AOLLAPP_SWITCH_v1_0_0 the AOI of LAPP_switch AOLLAPP_SWITCH_v1_0 aoi_M08T_instance Switch_nput M08TLData Switch Parameter ? X. Enter Name Fater Show: All Tags Image: Anite AOI_LAPP_S the AOI and Type Description Image: AOI_LAPP_S Image: AOI_LAPP_	AOLLAPP_SWITCH_v1_0_0 the AOI of LAPP_switch AOLLAPP_SWITCH_v1_0 aoi_M08T_instance switch_input M08TLData Switch_Output Switch Parameter ? Enter Name Filter Show: All Tags T. Aname AOLLAPP_S the AOI of LAPP switch Data Type Description Description AB:ETHERNE H-M08T:LData DINT[5] H-M08T:O AB:ETHERNE H-M08T:O AB:ETHERNE H-M08T:O AB:ETHERNE H-M08T:O AB:ETHERNE Substance AOLLAPP_S the AOI of LAPP_SWITCH Switch Substance AOLLAPP_S Substance AOLLAPP_S AB:ETHERNE Substance AB:ETHERNE AB:ETHERNE Substance AB:ETHERNE Substance AB:ETHERNE Substance AB:ETHERNE Substance AB:ETHERNE Substance Substance	AOLLAPP_SWITCH_v1_0_0 the AOI of LAPP_SWITCH_v1_0 aoi_M08T_instance Switch-Input M08T_IData Switch-Unput Switch Parameter ? 			the A(DI of LAPP	
the AOI of LAPP switch AOI_LAPP_SWITCH v1_0 aoi_M08T_instance Switch_Input Switch_Output Switch_Output Switch_Output Switch_Output Switch_Output Switch_Output Show: All Tags Name Image: Data Type Description Image: Data Type	the AOI of LAPP switch AOI_LAPP_SWITCH v1_0 aoi_M08T_instance Switch_Input Switch_Output Switch_Output Switch_Parameter ? Enter Name Filter Show: All Tags Name Ell Data Type Description H-aoi_M08T:Instance AOI_LAPP_S the AOI of LAPP switch H-M08T:C AB:ETHERNE H-M08T:LData DINT[5] H-M08T:O AB:ETHERNE	the AOI of LAPP switch AOL_LAPP_SWITCH_vr_0 aoi_M08T_instance Switch_Input Switch_Output Switch Parameter ? Enter Name Filter Show: All Tags H-aoi_M08T_instance AOL_LAPP_S H-aoi_M08T_instance AOL_LAPP_S H-aoi_M08T_instance AOL_LAPP_S H-M08T:C AB:ETHERNE H-M08T:I AB:ETHERNE H-M08T:O AB:ETHERNE	the AOI of LAPP switch AOI_LAPP_SWITCH v1_0 aoi_M08T_instance with Switch_Input M08T:LData Switch_Output Switch Parameter ? Y. Enter Name Filter Show: All Tags ✓ Name == Data Type Description → -aoi_M08T_instance AOI_LAPP_S the AOI of LAPP switch → -M08T:C AB:ETHERNE → -M08T:I AB:ETHERNE → -M08T:IData DINT[5] → -M08T:O AB:ETHERNE			-AOI_LAPP	SWITCH_v1_0_0-	
Name Ell Data Type Description Image: M08T_instance AOL_APP_S the AOI of LAPP switch Image: M08T: C AB:ETHERNE Image: M08T: I AB:ETHERNE Image: M08T: IData DINT[5] Image: M08T: O AB:ETHERNE	Name EI Data Type Description Image: Aoi_M08T_instance AOi_LAPP_S the AOI of LAPP switch Image: M08TC AB:ETHERNE Image: M08T:I AB:ETHERNE Image: M08T:I AB:ETHERNE Image: M08T:IData DINT[5] Image: M08T:O AB:ETHERNE	Name ==[Data Type Description	Name =:::] Data Type Description Image: second secon	Y. Enter Nam	the AOI of AOI_LAPP Switch_Inj Switch_Oo Switch Pa	LAPP switc _SWITCH_v put M08T:LI utput arameter Show: /	h 1_0 aoi_M08T_in Data All Tags	istance ?
	• aoi_M08T_instance AOI_LAPP_S the AOI of LAPP switch • M08T:C AB:ETHERNE • M08T:I AB:ETHERNE	→ aoi_M08T_instance AOI_LAPP_S the AOI of LAPP switch → M08T:C AB:ETHERNE → M08T:I AB:ETHERNE → M08T:I AB:ETHERNE → M08T:I AB:ETHERNE → M08T:I AB:ETHERNE		Name	=== [)ata Type	Description	^
Image: Most: I.Data DINT[5] Image: Bit = 1 Image: Bit =	M08T:LData DINT[5]	MO8T:LData DINT[5] MO8T:O AB:ETHERNE	MOBT:LData DINT[5] MOBT:O AB:ETHERNE Controller		8T_instance A : A A	OI_LAPP_S B:ETHERNE B:ETHERNE	the AOI of LAPP 	switch
			Controller	1 + M08 + M08T:O	T:I.Data D) A	NNT[5] B:ETHERNE		E

For all other tags, manually type the tag names:

AOI Tag	Reference Tag Name
AOI_LAPP_SWITCH_v1_0	aoi_M08T_instance
Switch_Input	LAPP_ M08T:I.Data
Switch_Output	LAPP_ M08T:O.Data
Switch_Parameter	lapp_param
Get_AllMessage	LAPP_GetMSG
Set_Message	LAPP_SetMSG
storage	LAPP_allstorage
Set_Data	LAPP_SetData
Get_SingMessage	LAPP_GetSingle
storage_single	LAPP_singlestorage

3. Click the square button to the right of the **Get_AllMessage** tag and configure all parameters as follows: (Service Code: 1; Class: 1; Instance: 1; Attribute: 1; Destination: LAPP_allstorage[0])

Message Configuration - LAPP_GetMSG	
Configuration* Communication Tag	
Message Type: CIP Generic	•
Service Custom Type: Service 1 (Hex) Class: 1 (Hex) Code: 1 Attribute 1 (Hex)	Source Element: Source Length: 0 (Bytes) Destination Element:
	New Fag
⊖ Enable ⊖ Enable Waiting ⊖ Start	🔾 Done 🛛 Done Length: 0
○ Error Code Extended Error Error Path: Error Text:	🥅 Timed Out 🗲

Click the **Communication** tab and set up the communication path to the LAPP Ethernet switch for

Get_AllMessage

Message Co	onfiguration - LAPP_GetMSG ion* Communication Tag	
Pat	th:	Browse
Com © C © C © C © C © C © C © C © C © C © C	Message Path Browser Path: M08T M08T M08T Backplane, CompactLogix System Backplane, CompactLogix System 1769-L32E Ethernet Port LocalENB T769-L32E Ethernet Port LocalENB Ethernet T769-L32E Ethernet Port LocalENB Ethernet CompactBus Local	
	OK Cancel Hel	

4. Click the square button to the right of the **Set_Message** tag and configure all parameters as follows: (Service Code: 10; Class: f6; Instance: 1; Attribute: 1; Source Ethernet: LAPP_SetData)

Message Configuration - LAPP_SetMSG	×
Configuration* Communication Tag	
Message Type: CIP Generic	_
Service Custom Type: Service 10 (Hex) Class: f6 (Hex) Code: 1 Attribute: 1 (Hex)	Source Element: LAPP_SetData Source Length: 0 (Bytes) Destination Element: New Tag
 Enable	 ○ Done Done Length: 0 □ Timed Out ◆

Click the **Communication** tab and set up the communication path to the LAPP Ethernet switch for **Set_Message**

Message Co	nfiguration - LAPP_SetMSG
Pati Bro Commu @ CIP	Message Path Browser
CIP Sou Co	Backplane, CompactLogix System Backplane, CompactLogix System Diff 1769-L32E ETHERLINE_ACCESS_M08T Diff 1769-L32E Ethernet Port LocalENB Diff 1769-L32E Diff 1769-L32E
) Error C Error Path: Error Text:	OK Cancel Help at

5. Click the square button to the right of the **Get_SingMessage** tag and configure all parameters as follows:

Service Code: e; Class: f6; Instance lessage Configuration - LAPP_GetSingle Configuration* Communication Tag Message Type: CIP Generic	: 1; Attribute	e: 1; Destination: LAPP_:	Singlestorage
Service Type: Service e (Hex) Class: f6 (Hex) Code: e (Hex) Class: f6 (Hex) Instance: 1 Attribute: 1 (Hex)	Source Element: Source Length: Destination Element:	▼ 0 ÷ (Bytes) LAPP_singlestorage ↓ New Tag	
○ Enable ○ Enable Waiting ○ Start ○ Error Code Extended Error Error Path: Error Text:	O Done	Done Length: 0 □ Timed Out ←	

Click the **Communication** tab and set up the communication path to the LAPP Ethernet switch for **Get_SingMessage**

Message Cor	nfiguration - LAPP_GetSingle
Configurat	Message Path Browser
Pa	Path: M08T
🔿 Broa	MOST
Commu © CIP	E 🔄 I/O Configuration E 🗊 Backplane, CompactLogix System 🛍 1769-L32E ETHERLINE_ACCESS_M08T
CIP Sou	☐ -
Co	ETHERNET-MODULE M08T ection
) Enable	
⊖ Error C Error Path: Error Text:	OK Cancel Help

Download the configured AOI to the Rockwell PLC

 Click the **Network** Icon, select the Rockwell PLC connected to the LAPP switch and click **Download** to install the AOI configuration to the PLC.

Path: www.endlines.com www.endlines.com"/>www.endlines.com wwwwwwww.endlines.com"/>www.endlines.com	
▼ 平 × 拍 読 読 時 師 ded st de ▼ ↔> Select Recent Communications Path	
Controller Path LAPPGroup_Switch_M08T_A0I 4B_ETHIP-1\192.168.127.28\Backplane\0	Go Online Upload Download Close Help
Show Only Paths Matching Serial Number in Project Serial Number in Project: <none> Path in Project: <none></none></none>	Reset Path List Set Project Path Clear Project Path

2. After finishing configuration, go to the controller organizer window, right click **Controller Tags** and select **Monitor Tags** to check if each tag can display the correct value transferred from the Ethernet device.

RSLogix 5000 - ETHERLINE_ACCESS_M08T [1769-L32E 20.12]* - [MainProgram - MainRoutine]				
	A A A Free Part A A				
		a Languaye 🔹 🔽	<u> </u>		
Rem Run 🔃 Run Mode	n: AB_ETHIP-1\192.168.127.28\Backplane\0*				
No Forces					
No Edits 🚔 🖬 1/0 OK					
	Favorites 👗 Add-On 👗 Alarms 👗 Bit 🧎 Timer/Counter 👗				
Controller Organizer	▼ # X HH B\$ B\$ B\$ B\$ 00 * a ▼ ↔		1 30		
Controller ETHERLINE_ACCESS_M08T		нннн			
문 Controller Teas					
Controller F 🖉 New Tag Ctrl+W					
Monitor Tags	0				
Edit Tags					
Progr Export Tags					
Main					
Unschedule Print					
🖶 🔄 Motion Groups					
Ungrouped Axes					
🚊 📥 Add-On Instructions					
AOL_LAPP_SWITCH_v1_0_0					
Parameters and Local Tags	(End)				
Controller Organizer				- 🔽 Enter Name Filter	
Controller Organizer V # X	Scope: 10 ETHERLINE_AC - Show: All Tags	Walua 🗧 Engra Mark 🍝	Shia Data Tuna	Enter Name Filter Description Constant	
Controller Organizer • 0 X	Scope ∰ETHERLINE_AC Show All Tags Name	Value Force Mask	Style Data Type ADI_LAPP_SWI	Enter Name Filter Description Constant the AOI of LAPP	
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Controller Organizer • 0. X	Scope BETHERLINE_ACL Show: All Tags Name ::::::::::::::::::::::::::::::::::::	Value Force Mask {} {} {} {} {} {}	Style Data Type AOL_LAPP_SWI AOL_LAPP_SWI Decimal SINT[200] MESSAGE MESSAGE	C. Enter Name Filter Description Constant the A01 of LAPP	
Controller Organizer • 4 × Controller ETHERLINE ACCESS_MOBT - Controller Tags - Controller Tags - Controller Fault Handler - Controller F	Scope <u>BD</u> ETHERLINE_AC Show: All Tags Name z8 A + aog_M00T_instance z8 A + LAPP_SatKrape + LAPP_GeNS0 + LAPP_GeNS0 LaPP_GenStrape	Value • Force Mask • {} {} {} {} {} {} {} {} {} {} {} {}	Style Data Type ADLAPP_SVIL. Decimal SINT[200] MESSAGE MESSAGE LAPP_Swith Pa	Frater Hanne Filter. Description Constant the AOI of LAPP	
Controller Organizer • 0 X	Scope <u>B</u> _ETHERLINE_A(Value Face Mask {} {} {} {} {} {} {} {} {} {} {} {} {	Style Data Type AGL_LAPP_SV/L. Decimal SINT200] MESSAGE LAPP_Switch_Pa. LAPP_Switch_Wa.	Y. Enter Manae Filter. Description Constant the ADI of LAPP recieve message.	
Controller Organizer • 0. X	Scope <u>B</u> ETHERLINE_AC Show: All Tags Name ±8[A + ad. W000 jinitance ±8[A + LAPP_altitrage + LAPP_GetMSG + LAPP_GetSrgle - lapp_param + lapp_paramSwitch_fout + lapp_paramSwitch_fout	Value Force Mask <th <th<="" td=""><td>Style Data Type ADI_LAPP_SWL. ADI_LAPP_SWL. Decimal SINT[200] MESSAGE MESSAGE LAPP_Switch_Ba. LAPP_Switch_M. Decimal DINT</td><td>Y. Enter Hame Filter. Description Constant Ibe ADI of LAPP</td></th>	<td>Style Data Type ADI_LAPP_SWL. ADI_LAPP_SWL. Decimal SINT[200] MESSAGE MESSAGE LAPP_Switch_Ba. LAPP_Switch_M. Decimal DINT</td> <td>Y. Enter Hame Filter. Description Constant Ibe ADI of LAPP</td>	Style Data Type ADI_LAPP_SWL. ADI_LAPP_SWL. Decimal SINT[200] MESSAGE MESSAGE LAPP_Switch_Ba. LAPP_Switch_M. Decimal DINT	Y. Enter Hame Filter. Description Constant Ibe ADI of LAPP
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Controller Organizer • 4 × Controller ETHERLINE ACCESS_MOBT - Controller Tags - Controller Tags - Controller Full Handler - Power-Up Handler	Scope <u>B</u> _ETHERLINE_AC Show: All Tags Name 28 / ^ + adv_M00T_instance 28 / ^ + LAPF_aisticage + + LAPF_GeNSingle - blogp_para + blogp_basins + blog_basins + blogbasins	Value Frace Mask {} {} {} {} {} {} {} {} {} {} {} {} {} {} 0 () {} 91 91 775	Style Data Type ADI_LAPP_SVI ADI_LAPP_SVI Decimal SINT[200] MESSAGE LAPP_Studt-pt. LAPP_Studt-pt. DINT Decimal INT Decimal INT	Control Control Contro Control Control Control Contro	
Controller Organizer • 4 X Controller THERLINE ACCESS_M08T Controller Tags Controller Controller Tags Controller Tags Controller Controller	Scope <u>B</u> _ETHERLINE_AC Show: All Tops Name 128 A + ody_M00T_instance 128 A + LAPP_aiticrage 1 + LAPP_GenSingle 1 + LaPP_genSingle 1 + lapp_param 1	Value Force Mask. [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] 991 775 7 7	Style Data Type ADL_LAPP_SWL. ADL_LAPP_SWL. Decimal SINT2001 MESSAGE MESSAGE LAPP_SWL. Decimal Decimal DINT Decimal INT Decimal INT Decimal INT Decimal INT	Criter Adams Files. Description Constant the ACI of LAPP recleve message. recleve message. recleve message. recleve Message In. doars 001 DVVA Veredor ID. DOVA Veredor ID. DOVA Veredor ID. Norts-Booton E.	
Controller Organizer • 4 ×	Scope DETHERLINE_AC Show: All Tops Hane ES[A + aci, M00T_Instance + LAPP_datoage LAPP_detSingle - LAPP_GetSingle - LAP_GetSingle - LA	Vglae Face Mask {} {} {} {} {} {} {} {} {} {} {} {} {} {} {} {} 0 0 {} {} 991 775 7 0	Style Data Type ADI LAPP SWL. SNT[200] Decimal SNT[200] MESSAGE MESSAGE LAPP Switch, M. Decimal Decimal INT Decimal INT Decimal INT Decimal INT Decimal SINT	Crear Mann Fale: Crear Mann Fale: Contain the ADI of LAPP Tecleve message. data 601 DVA Verskin D. DA07Manage. M65704006 M657-04006 M657-04006	
Controller Organizer • 4 × Controller THIFRLINE ACCESS_MOBT 	Scope <u>Bp</u> ETHERLINE_AC Show: All Tags Name ::28 -0. + ood_MG0T_Instance :28 -0. + LAPP_GeNSrgle : + LAPP_GeNSrgle : - Happ_passn.Switch_Inst : + Happ_passn.Switch_Unst :	Value Force Mask () () () () () () () () () () () () () () () () () () 0 () 775 7 0 0 0 0	Style Data Type AD1_LAPP_SVIL. AD1_LAPP_SVIL. Decimal SINT[200] MCSSAGE MCSSAGE LAPP_Svitch_PA. Decimal Decimal INT Decimal INT Decimal SINT Decimal SINT	Crater Manuel Aller. Contrart the ADI of LAPP Index ADI of LAPP Most House ADI of LAPP The ADI of LAPP	
Controller Organizer • 4 X	Scope DETHERLINE_AC Show: All Tags Name III A Show: All Tags Name III A Show: All Tags A add MOBT_instance III APP_aditoage III LAPP_GeNSingle III LAPP_GeNSingle III LAPP_GeNSingle IIII APP_GeNSingle IIII APP_GENSingle IIII APP_GENSingle IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Value Force Mask [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] []	Style Data Type ADI_LAPP_SWL. ADI_LAPP_SWL. Decimal SINT[200] MCSSAGE LAPP_SWLC_Pa. LAPP_SwLC_Pa. LAPP_SwLC_Pa. Decimal INT Decimal INT Decimal INT Decimal INT Decimal SINT	Control Kanne Faller. Description Constant tre ACI of LAPP recleve message recleves message recleves message dots 0.01 DDVA Versdor ID DDVA Versdor ID Most revision of Near revision of Seid number of Seid number of	
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NOTE Only LAPP pre-configured tags will display the correct values. Refer to the **CIP Tags** section below for detailed information.

Sample AOI Project

For easier AOI installation, LAPP has also provided a sample AOI project, in which all the parameters are configured with default values. The sample project is a (.ACD) file, which is available for download from the LAPP website. You may import the sample project in RSLogix 5000, and directly download this AOI to the PLC with minimal installation steps. But to use the sample project, you still must change or set up the parameters below.

- 1. Change the controller type used in the real environment.
- 2. Change the controller and LAPP switch's IP address.
- 3. Setup the Project path.

NOTE The sample AOI project supports RSLogix 5000 version 20.

CIP Tags

There are tags for each CIP object. The tags correspond to the object's attributes.

Tags for Identity Object

Data Type: LAPP_Identity_Object_v0

Name	Data Type	Description
Vendor ID	INT	991
Device Type	INT	0x307, "Managed Ethernet Switch"
Product Code	INT	ETHERLINE ACCESS M05T=0x0006,
		ETHERLINE ACCESS M08T=0x0007
Major Revision	SINT	The structure member, major
Minor Revision	SINT	The structure member, minor
Serial Number	DINT	Switch serial number
Product Name	STRING	Switch model name
Assigned Name	STRING	User assigned switch name
Geographic Location	STRING	User assigned switch location

Tags for TCPIP Object

Data Type: LAPP_TCPIP_Interface_Object_v0

Name	Data Type	Description
Status	DINT	Interface status
Configuration	DINT	Interface capability flags
Configuration Control	DINT	Interface control flags
Path Size	INT	Size of Path
Object Path 1	INT	Logical segments identifying the physical link object
Object Path 2	INT	Logical segments identifying the physical link object
IP Address	DINT	The device's IP address
Network Mask	DINT	The device's network mask
Gateway Address	DINT	Default gateway address
Name Server 1	DINT	Primary name server
Name Server 2	DINT	Secondary name server
Domain Name	STRING	Default domain name
Host Name	STRING	Host name

Tags for Ethernet Link Object

Name	Data Type	Description
Interface Speed	DINT	Interface speed currently in use. Speed in Mbps (e.g., 0, 10, 100, 1000, etc.)
Interface Flags	LAPP_Interface_O bject_Flags_v0	Interface status flags
Physical Address	SINT[6]	MAC layer address
InOctets	DINT	Octets received on the interface
InUcastPackets	DINT	Unicast packets received on the interface
InNucastPackets	DINT	Non-unicast packets received on the interface
InDiscards	DINT	Inbound packets received on the interface but discarded
InErrors	DINT	Inbound packets that contain errors (does not include In Discards)
OutOctets	DINT	Octets sent on the interface
OutUcastPackets	DINT	Unicast packets sent on the interface
OutNucastPackets	DINT	Non-unicast packets sent on the interface
OutDiscards	DINT	Outbound packets discarded
OutErrors	DINT	Outbound packets that contain errors
Alignment Errors	DINT	Frames received that are not an integral number of octets in length
FCS Errors	DINT	Frames received that do not pass the FCS check
Single Collisions	DINT	Successfully transmitted frames which experienced exactly one collision
Multiple Collisions	DINT	Successfully transmitted frames which experienced more than one collision
SQE Test Errors	DINT	Number of times SQE test error message is generated
Deferred	DINT	Frames for which first transmission attempt is delayed because
Transmissions		the medium is busy
Late Collisions	DINT	Number of times a collision is detected later than 512 bit-times into the transmission of a packet
Excessive Collisions	DINT	Frames for which transmission fails due to excessive collisions
MAC Transmit Errors	DINT	Frames for which transmission fails due to an internal MAC sublayer transmit error
Carrier Sense Errors	DINT	Times that the carrier sense condition was lost or never asserted when attempting to transmit a frame
Frame Too Long	DINT	Frames received that exceed the maximum permitted frame size
MAC Receive Errors	DINT	Frames for which reception on an interface fails due to an internal MAC sublayer receive error
Control Bits	INT	0 Auto-negotiate 0 indicates 802.3 link auto-negotiation is disabled. 1 indicates auto-negotiation is enabled
Forced Interface	INT	Speed at which the interface shall be forced to operate. Speed in Mbps (10, 100, 1000, etc.)
Interface Label	STRING	Label like "TX5"
Interface Port Index	DINT	Port index
Interface Port Description	STRING	Port description
Broadcast Storm	SINT	
Protection		
Interface Utilization	SINT	Percentage of entire interface bandwidth being used (0-100)
Utilization Alarm Upper	SINT	Upper percentage at which to declare an utilization alarm (0-
Inreshold	CINT	100)
Threshold	SINT	100)
Port Link Alarm	SINT	0: Ignore, 1: On (Relay 1), 2: On (Relay 2), 3: Off (Relay1),
		4: Off (Relay2)
Alarm	SINI	0: Disable, 1: Enable(Relay 1),
Tx Unicast Packet Pato	DINT	Number of TX unicast nackets per second
Ry Unicast Packet Rate	DINT	Number of RX unicast packets per second
Tx Multicast Packet	DINT	Number of TX multicast packets per second
Rx Multicast Packet Rate	DINT	Number of RX multicast packets per second
Tx Broadcast Packet Rate	DINT	Number of TX broadcast packets per second
Rx Broadcast Packet	DINT	Number of RX broadcast packets per second

Rate				
Tx Multicast Packet	DINT	Total number of TX multicast packets		
Rx Multicast Packet	DINT	INT Total number of RX multicast packets		
Tx Broadcast Packet	DINT	INT Total number of TX multicast packets		
Rx Broadcast Packet	DINT	Total number of RX broadcast packets		
Redundant Port Status DINT Bit 0 = Disable,				
Bit $1 = $ Not Redundant port,				
		Bit 2 = Link down,		
		Bit 3 = Blocking,		
		Bit 4 = Learning,		
		Bit 5 = Forwarding		

Tags for LAPP Networking Object

Data Type: LAPP_Vendor_Object_v0

Name	Data Type	Description			
System Firmware	DINT	Switch firmware version			
Version					
System Fault Status	DINT	Switch fault status			
Switch Port Number	SINT	Switch max port number			
Port Exist	DINT[2]	Switch per port exist			
Port Enable	DINT[2]	Switch per port exist			
		0:Enable			
		1:Disable			
Port Link Status	DINI[2]	Switch per port link status			
IGMP Shooping	SINT	IGMP snooping enable:			
		U: Disable			
	DINT				
Query Interval		Query Interval range from 20~600 sec			
IGMP Enhanced Mode	SINT	IGMP ennanced mode			
		U: Disable (default)			
Delay 1	CINT	1: Enable			
Relay 1	SINT	Override relay warning setting			
		U: Disable (delauit)			
Dolovy 2	CINT	1. Elidule Override relay warning cetting			
Relay 2	51111	Overnue relay warning setting			
		1. Enable			
Power 1 Polay Warping	SINT	Power input 1 failure (on \rightarrow off)			
Fower I Kelay Warning	31111	0: Disable (default)			
		1: Enable (relavit)			
		2: Enable(relay 2)			
Power 2 Relay Warning	SINT	Power input 2 failure (on \rightarrow off)			
Tower 2 Relay Warning	51111	0: Disable (default)			
		1: Enable(relay 1)			
		2: Enable(relay 2)			
DI 1 Off Relay Warning	SINT	DI 1 (off)			
	01	0: disable (default)			
		1: Enable(relay 1)			
		2: Enable(relay 2)			
DI 1 On Relay Warning	SINT	DI 1 (on)			
, ,		0: Disable (default)			
		1: Enable(relay 1)			
		2: Enable(relay 2)			
DI 2 Off Relay Warning	SINT	DI 2 (off)			
		0: Disable (default)			
		1: Enable(relay 1)			
		2: Enable(relay 2)			
DI 2 On Relay Warning	SINT	DI 2 (on)			
		0: Disable (default)			
		1: Enable(relay 1)			
		2: Enable(relay 2)			
Turbo Ring Break Relay	SINT	Turbo Ring Break (Ring Master Only)			
Warning		0: Disable (default)			
		1: Enable (relay 1)			
		2: Enable (relay 2)			
CPU Usage	SINI	Percent of usage (0-100)			
Device Up Time		Number of seconds since device was powered up			
Reset Mib Counter	SINT	Reset port MIB counters			
Redundant Device Mode	DINT	Bit 0: RSTP,			

		Bit 1: Turbo Ring, Bit 2: Turbo Ring v2, Bit 3: Turbo Chain, Bit 4: None
Reset Device	SINT	1: restart the device 2: reset to default

Pre-configured Tags in the LAPP AOI

The LAPP AOI supports all the CIP tags listed in the tables above. But in the AOI, we only pre-configure logic links between selected tags and LAPP switches. To monitor the non-configured tags, PLC programmers need to create the links manually. Otherwise, in RSLogix 5000, the value column of these tags will display as "0". If you experience problems creating new links, please contact LAPP technical support for assistance.

NOTE For pre-configured tags, LAPP has already created the logic links between the CIP tags and LAPP Ethernet switches so RSLogix 5000 can get/set the switch information correctly.

The table below specifies all the pre-configured tags in LAPP AOI with a % mark.

Pre-Configured Tags	Name
Identity Object (0x01)	
*	Vendor ID
*	Device Type
*	Product Code
	Revision
	Status
*	Serial Number
*	Product Name
	Assigned Name
	Geographic Location
TCP/IP Interface Object (0xf5)	· · · ·
	Status
	Configuration Capability
	Configuration Control
	Physical Link Object
	Interface Configuration
*	IP Address
*	Network Mask
	Gateway Address
	Name Server
	Name Server 2
	Domain Name
*	Host Name
Ethernet Link Object (0xf6)- by p	ort
*	Interface Speed
*	Interface Flags
	Link Status
	Half/Full Duplex
	Negotiation Status
	Manual Setting Requires Reset
	Local Hardware Fault
*	Physical Address
	Interface Counters
	In Octets
	In Ucast Packets
	In Nucast Packets
	In Discards
*	In Errors
	Out Octets
	Out Ucast Packets
	Out Nucast Packets
	Out Discards
*	Out Errors
	Media Counters
	Interface Control
*	Control Bits
*	Forced interface Speed
	Interface Lable

	Interface Description
	Interface Port Description
	Broadcast Storm Protection
*	Interface Utizatiion
	Utilization Alarm Upper Threshold
	Utilization Alarm Lower Threshold
	Port Link Alarm
	Port Traffic-Overload Alarm
*	Tx Unicast Packet Rate
×	Px Unicast Packet Pate
*	
× ·	
*	RX Multicast Packet Rate
*	TX Broadcast Packet Rate
*	Rx Broadcast Packet Rate
	Tx Multicast Packet
	Rx Multicast Packet
	Tx Broadcast Packet
	Rx Broadcast Packet
*	Redundant port status
Port Object (0xf4)	
	Port Type
	Port Number
	Link Object
	Port Name
	Port Type Name
	Port Description
	Node Address
	Port Key
LAPP Networking Object (0x	404)
Earl Networking Object (0x	
*	Firmware Version
* *	Firmware Version System Fault Status
× ×	Firmware Version System Fault Status Switch Port Number
* * *	Firmware Version System Fault Status Switch Port Number Port Exist
>> >><	Firmware Version System Fault Status Switch Port Number Port Exist Port Enable
>> >><	Firmware Version System Fault Status Switch Port Number Port Exist Port Enable Port Link Status
>> >><	Firmware Version System Fault Status Switch Port Number Port Exist Port Enable Port Link Status IGMP Snooping Enable
>> >><	Firmware Version System Fault Status Switch Port Number Port Exist Port Enable Port Link Status IGMP Snooping Enable Ouery Interval
>> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >>	Firmware Version System Fault Status Switch Port Number Port Exist Port Enable Port Link Status IGMP Snooping Enable Query Interval IGMP Enbanced Mode
>> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >> >>	Firmware Version System Fault Status Switch Port Number Port Exist Port Enable Port Link Status IGMP Snooping Enable Query Interval IGMP Enhanced Mode Relav1
X X X X X X X X X X X X X X X X X X	Firmware Version System Fault Status Switch Port Number Port Exist Port Enable Port Link Status IGMP Snooping Enable Query Interval IGMP Enhanced Mode Relay1 Relay2
X X X X X X X X X X X X X X X X X X X X X X X X X X X X X X X X	Firmware Version System Fault Status Switch Port Number Port Exist Port Enable Port Link Status IGMP Snooping Enable Query Interval IGMP Enhanced Mode Relay1 Relay2 Power 1 relay waring
X X X X X X X X X X X X X X X X X X X X X X X X X X X X X X X X	Firmware Version System Fault Status Switch Port Number Port Exist Port Enable Port Link Status IGMP Snooping Enable Query Interval IGMP Enhanced Mode Relay1 Relay2 Power 1 relay waring Power 2 relay waring
>> >> >>	Firmware Version System Fault Status Switch Port Number Port Exist Port Enable Port Link Status IGMP Snooping Enable Query Interval IGMP Enhanced Mode Relay1 Relay2 Power 1 relay waring Power 2 relay waring DI 1(off) relay waring
Image: Second	Firmware Version System Fault Status Switch Port Number Port Exist Port Enable Port Link Status IGMP Snooping Enable Query Interval IGMP Enhanced Mode Relay1 Relay2 Power 1 relay waring Power 2 relay waring DI 1(off) relay warning DI 1(op) relay warning
Image: Second	Firmware Version System Fault Status Switch Port Number Port Exist Port Enable Port Link Status IGMP Snooping Enable Query Interval IGMP Enhanced Mode Relay1 Relay2 Power 1 relay waring DI 1(off) relay warning DI 1(off) relay warning
Image: Second state Image: Second state Imag	Firmware Version System Fault Status Switch Port Number Port Exist Port Enable Port Link Status IGMP Snooping Enable Query Interval IGMP Enhanced Mode Relay1 Relay2 Power 1 relay waring DI 1 (off) relay warning DI 2(off) relay warning DI 2(off) relay warning
Image: Second state Image: Second state Imag	Firmware Version System Fault Status Switch Port Number Port Exist Port Enable Port Link Status IGMP Snooping Enable Query Interval IGMP Enhanced Mode Relay1 Relay2 Power 1 relay waring DI 1 (off) relay warning DI 2(off) relay warning DI 2(on) relay warning Turbo Ring Break relay warning
Image: Second state Image: Second state Imag	Firmware Version System Fault Status Switch Port Number Port Exist Port Enable Port Link Status IGMP Snooping Enable Query Interval IGMP Enhanced Mode Relay1 Relay2 Power 1 relay waring DI 1(off) relay warning DI 2(off) relay warning DI 2(on) relay warning CPUL usage
Image: Second state Image: Second state Imag	Firmware Version System Fault Status Switch Port Number Port Exist Port Enable Port Link Status IGMP Snooping Enable Query Interval IGMP Enhanced Mode Relay1 Relay2 Power 1 relay waring DI 1(off) relay warning DI 2(off) relay warning DI 2(on) relay warning CPU usage Davies Un Time
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Image: Second state Image: Second state Imag	Firmware Version System Fault Status Switch Port Number Port Exist Port Enable Port Link Status IGMP Snooping Enable Query Interval IGMP Enhanced Mode Relay1 Relay2 Power 1 relay waring DI 1(off) relay warning DI 2(off) relay warning DI 2(off) relay warning CPU usage Device Up Time Reset MIB Counts
Image: Second state Image: Second	Firmware Version System Fault Status Switch Port Number Port Exist Port Enable Port Link Status IGMP Snooping Enable Query Interval IGMP Enhanced Mode Relay1 Relay2 Power 1 relay waring DI 1(off) relay warning DI 2(off) relay warning DI 2(off) relay warning Turbo Ring Break relay warning CPU usage Device Up Time Reset MIB Counts Redundant device mode
X X X X X X X X X X X X X X X X X X X X X X X X X X X X X X X X X X X X X X X X	Firmware Version System Fault Status Switch Port Number Port Exist Port Enable Port Link Status IGMP Snooping Enable Query Interval IGMP Enhanced Mode Relay1 Relay2 Power 1 relay waring DI 1(off) relay warning DI 2(off) relay warning DI 2(on) relay warning CPU usage Device Up Time Reset MIB Counts Redundant device mode reset device
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Image: Second state Image: Second	Firmware Version System Fault Status Switch Port Number Port Exist Port Enable Port Link Status IGMP Snooping Enable Query Interval IGMP Enhanced Mode Relay1 Relay2 Power 1 relay waring DI 1(off) relay warning DI 1(off) relay warning DI 2(off) relay warning DI 2(on) relay warning CPU usage Device Up Time Reset MIB Counts Redundant device mode reset device Switch Fault Status

Monitoring AOI Tags

In RSLogix 5000, you can monitor the values of all configured tags by selecting "Monitor Tags" in the controller organizer window. It can also be used to check that the AOI is installed correctly

NOTE Only LAPP pre-configured tags will display the correct values. Refer to the **CIP Tags** section above for detailed information.



Monitor Tags for Identity Object

Click LAPP_param Switch_Identity and expand the list to check the values for Identity tags.

Monitor Tags for TCPIP Object

Click LAPP_param Switch_TCPIP and expand the list to check the values for TCPIP tags.

Monitor Tags for Ethernet Link Object

Click **LAPP_param Switch_Ethernet_Link** and expand the list to check the values for per port Ethernet Link tags.

Monitor Tags for LAPP Networking Object

Click LAPP_param Switch_Vendor and expand the list to check the values for LAPP custom tags.

Rockwell FactoryTalk® View Faceplate

FactoryTalk® View Faceplate Installation

To install the faceplate, you must have Rockwell FactoryTalk® View Studio SE (Site Edition) version 7 or later and a LAPP managed Ethernet switch, which supports EtherNet/IP.

Create a FactoryTalk® View Shortcut to the PLC

1. Start the FactoryTalk® View Studio software and select Site Edition (Local).

2. Add a new Site Edition (Local) and enter the Application name.



3. Configure a shortcut to the PLC that is running the LAPP AOI.

In the Explorer window, right click the newly-added application, select **Add New Server** and **Rockwell Automation Device Server (RSLinx Enterprise)**, and click OK.

💋 FactoryTalk View Studio	- View Site Edition (Loca	l Station)
File View Settings To	ols Window Help	
🜌 🖶 🍜 🗅 🚔 💽	0 🗟 🗘 🗟	
Explorer LAPGroup MC P Rutime Set P Rutim	Delete Delete Add New Server Security Properties properties ssages uplates pshots ms uplates pshots ms uplates ssages uplates ssages uplates ssages	Rockwell Automation Device Server (RSLinx Enterprise) OPC Data Server Tag Alarm and Event Server RSLinx Enterprise Server Properties General Alarms and Events Name Relation Enterprise Description Computer hosting the RSLinx Enterprise server: localhost

🔊 🕽 Communication Setup - R	RNA://\$Local/LAPPGroup_M08T_SE/RSLinx Ente	rprise	
Device Shortcuts Add Remove Remove PLC	Apply	Primary □ ■ RSLinx Enterprise, JASONLU-PC ⊕ ■ 1789-A17, Backplane □ ♣ EtherNet, Ethernet □ ↑ 172.21.3.250, SDS-3008-T □ ₱ 192.168.127.28, Ethernet Bridge (1769-L32E), 1769-L32E Ethernet Port	
Offine Tag File Proce	SLinx Enterprise You've made the following changes to the sho Primary path edited - Old: - New: CompactLogix System.ETHERLINK_AC Press Yes to apply changes. Press No to discar	Compact Logix System, Compact Logix System Compact Logix Syste	Browse
Press Apply button to assign selection	cted path to this shortcut.		a duxfor
			Cancel Verify Help

4. The shortcut is named PLC. Click "Yes" to apply the configuration.

Import FactoryTalk® View Faceplate Graphics

1. Right click **Displays** in the FactoryTalk® View Explorer window, select **Import and Export** and choose **Import graphic information into displays**.



2. Select No and Multiple displays batch import file.

iraphics Import Export Wizard - Backup	Graphics Import Export Wizard - Import File Type
Do you want to backup the displays that will be modified by the import?	Select the type of file to import:
O Tes	
No	Multiple displays batch import file

3. Import all graphics files for FactoryTalk $\ensuremath{\mathbb{R}}$ View faceplate display.

NOTE LAPP provides sample graphics files for selected switches, which are available for download at the LAPP website.

BatchImport_LAPPGroup_M08T_SE.xml	2017/4/28	XML Document	1 KB
LAPP_Switch_DeviceInfo.xml	2017/4/28	XML Document	32 KB
LAPP_Switch_PortSetting.xml	2017/4/28	XML Document	26 KB
LAPP_Switch_PortStatus.xml	2017/4/28	XML Document	26 KB
MAIN_PAGE.xml	2017/4/28	XML Document	3 KB

4. After import, these objects will appear under **Displays** in the Explorer window.

: _ **	-
📄 🚞 Grapi	hics
📄 🛃 Di	splays
	LAPP_Switch_DeviceInfo
	LAPP_Switch_PortSetting
- 1	LAPP_Switch_PortStatus
	Logix_ALM
- 3	Logix_ALM_Config
- 5	Logix_ALM_Status
	Logix_ALMA
- 1	Logix_ALMA_Config
	Logix_ALMA_Status
- 1	Logix_ALMD
	Logix_ALMD_Config
	Logix_ALMD_Status
	Logix_CC

Import FactoryTalk® View Faceplate Global Object

- 1. Right click **Global Object** in the FactoryTalk® View Explorer window, select **Import and Export** and choose **Import graphic information into displays**.
- 2. Select No and Multiple displays batch import file.
- 3. Import all graphics files (such as below) for FactoryTalk® View faceplate global object.

BatchImport_Global_LAPPGroup_M08T_SE.xml	2017/5/3 XML Document	1 KB
LAPP_GDeviceInfo.xml	2017/5/3 XML Document	28 KB
LAPP_GPortSetting.xml	2017/5/3 XML Document	23 KB
LAPP_GPortStatus.xml	2017/5/3 XML Document	22 KB
LAPP_GSwitch.xml	2017/5/3 XML Document	12 KB
EAPP_OSWICH.XIII	2017/3/3 Xive Document	12 10

Import FactoryTalk® View Faceplate Local Message

1. Right click Local Message in the FactoryTalk® View Explorer window, select Add Component Into Application and import all the local message files (.loc)

NOTE L	LAPP provides sample local message files for selected switches, which are available for download at the LAPP website.
--------	---

LAPP_Detected_ABC01.loc	2015/1/28 LOC	3 KB
LAPP_LinkStatus.loc	2015/1/28 LOC	3 KB
LAPP_Port_Enable.loc	2015/1/28 LOC	3 KB
LAPP_Port_Link.loc	2015/1/28 LOC	3 KB
LAPP_Port_Num.loc	2015/1/28 LOC	3 KB
LAPP_Power_OnOff.loc	2015/1/28 LOC	3 KB
LAPP_Redundant_Mode.loc	2015/1/28 LOC	3 KB
LAPP_Redundant_Port.loc	2015/1/28 LOC	3 KB
LAPP_Redundant_Port_Role.loc	2015/1/28 LOC	3 KB
LAPP_Reset_Command.loc	2015/1/28 LOC	3 KB
LAPP_Speed_Duplex.loc	2015/1/28 LOC	3 KB

- 2. After import, these objects will appear under "Local Message" in the Explorer window.
- After import, these

Import FactoryTalk® View Faceplate Images

 Right click Images in the FactoryTalk® View Explorer window, select Add Component Into Application and import all the image files (.bmp)

NOTE LAPP provides sample image files for selected switches, which are available for download at the LAPP website

🛃 Arrow Down.bmp	2015/1/28	02:26	1 KB
🛃 Arrow Left.bmp	2015/1/28	02:26	1 KB
🛃 Arrow Right.bmp	2015/1/28	02:26	1 KB
🛃 Arrow Up.bmp	2015/1/28	02:26	1 KB
🛃 Backspace.bmp	2015/1/28	02:26	1 KB
🛃 End.bmp	2015/1/28	02:26	1 KB
🛃 Enter.bmp	2015/1/28	02:26	1 KB
K ETHERLINK-ACCE	2017/4/27	04:33	173 KB
🛃 Home.bmp	2015/1/28	02:26	1 KB
🛃 ICON-05_right.bmp	2015/1/28	02:26	37 KB
🛃 ICON-06_left.bmp	2015/1/28	02:26	37 KB
🛃 ICON-08_Up.bmp	2015/1/28	02:26	37 KB
🛃 ICON-09_Down.b	2015/1/28	02:26	37 KB
🛃 ICON-Active.bmp	2015/1/28	02:26	48 KB
🛃 ICON-deviceinfo	2015/1/28	02:26	39 KB
🛃 ICON-Enter.bmp	2015/1/28	02:26	48 KB
🛃 ICON-port_status	2015/1/28	02:26	39 KB
🛃 ICON-portSetting	2015/1/28	02:26	39 KB
🛃 LAPP_LOGO.bmp	2017/4/27	04:24	17 KB
🛃 Page Down.bmp	2015/1/28	02:26	1 KB
🋃 Page Up.bmp	2015/1/28	02:26	1 KB

2. After import, these objects will appear under "Local Message" in the Explorer window.



Import FactoryTalk® View Faceplate Parameter

1. Right click **Parameters** in the FactoryTalk® View Explorer window, and select **Add Component Into Application** and import the LAPP PARAM file (.par).



 A parameter file that will be associated with the display. Manually input "#1=[PLC]LAPP_param", and "#2=PLC" in the file.

<pre>Me Edit View Setting Tools Window Hep I I I I I I I I I I I I I I I I I I I</pre>
Image: Image
Sphere-LAPPCoup.MOST_SE Incl. MARCharp.MOST_SE Rel. March Security Rel. Rel. March Security Rel. Rel. March Security
Council (ASOULPAC) Is APProved, MMT 25 Ruture Security Ruture Secur

In the parameter definition, the shortcut PLC was created earlier. (Refer to Create a FactoryTalk® View Shortcut to PLC)

Another important piece is **lapp_param**, which is the name of the Switch_Parameters tag created for the LAPP_SWITCH_AOI in your RSLogix project. (Refer to **Create and configure tags for the AOI**)



Sample FactoryTalk® View Faceplate Project

For easier FactoryTalk® View Faceplate installation, LAPP also provides a sample project, in which all the parameters are configured with default values. The sample project is a (.APA) file, which is available for download from the LAPP website. You may import the sample project in FactoryTalk® View Faceplate Site Edition (SE).

Setting Up a FactoryTalk® View SE Client

1. Launch FactoryTalk® SE client



2. Set up the new configuration file name and path.



3. Select the application type Local FactoryTalk View SE Client Application Type

Select the type of SE application the client will connect to:

Network StationLocal Station

X

4. Enter the name of the application and select the language

FactoryTalk View SE Client Application Name	×
Type the name of the application you want to connect to: <u>LAPPGroup_MOST_SE</u>	
Open FactoryTalk View SE Client as view-only	
🔲 Enable on-screen keyboard	
Allow display code debugging	
🔽 Maintain Client Tag Connections	

5. Configure the FactoryTalk® View SE Client Components and set Initial Display to LAPP_Device_Info
FactoryTalk View SE Client Components

-Components		
Initial display:	LAPP_Switch_DeviceInfo	•
Display parameters:	/PLAPP_PARAM	
Initial client key file:		-
Startup macro:		•
Shutdown macro:		•

- 6. Configure the FactoryTalk® View SE Window Properties and input **Title bar text** with the text you would like to appear in the title bar.
- 7. Finish the setup and save the configuration

Introduction to the LAPP Custom Faceplate

The LAPP custom Faceplate consists of three main displays: Device Information, Port Status, and Port Setting. Click the tabs at the top of the screen to change between different displays.

Device Information

The device information display shows general switch information and power and link status.



The following table describes fields and values.

Field	Values	Description
IP Address	192.168.192.253 (factory default)	Switch IP address
Netmask	255.255.255.0	Switch subnet mask
MAC Address	xx:xx:xx:xx:xx	MAC address of switch
Serial No.	Max. 5 characters	Switch serial number
Firmware Ver.	Vx.x	Software version of switch
CPU Loading (%)	0-100%	CPU loading percentage
Redundant Protocol	RSTP Turbo Ring Turbo Ring v2 Turbo Chain	Redundant protocol setting
Power Input 1	On Off	Power supply 1 status
Power Input 2	On Off	Power supply 2 status
Model name	ETHERLINE ACCESS XXX	Switch model name
Switch name	Max. 30 characters	User assigned switch name

Field	Color	State	Description
Link Status	Green	Link Up	Current port link state
	Grey	Link Down	
Power Status	Amber	Power On	Current power link state
	Grev	Power Off	

Port Status

The port status display shows information for a selected switch port. Use the right/left buttons to select a switch port.

Z LAPP_Switch_PortStatus - /LAPPGroup	0_M08T_SE// 🗖 🗉 💌
	ERLINE ACCESS M08T aged Redundant Switch 06006
Device Por Info	tus Port Setting
Port Status	
Port 1	
Link Status	: Link Down
Speed	: Unknown
Redundant Port Status	: Forwarding
Tx Unicast (Packet/sec)	: 0
Rx Unicast (Packet/sec)	: 0
Tx Multicast (Packet/sec)	: 0
Rx Multicast (Packet/sec)	: 0
Tx Broadcast (Packet/sec)	: 0
Rx Broadcast (Packet/sec)	: 0
Tx Packet Error	: 0
Rx Packet Error	: 0

Field	Values	Description
Port Index	Port x	Selected port number
Link status	Link up	Selected port link status
	Link down	
Speed	10/Half	Selected port speed and mode
	10/Full	
	100/Half	
	100/Full	
	Unknown	
Redundant Port Status	Disable	Selected port redundancy status
	Not Redundant Port	
	Link Down	
	Blocking	
	Learning	
	Forwarding	
Tx Unicast (Packet/sec)		The Tx unicast packets per second
Rx Unicast (Packet/sec)		The Rx unicast packets per second
Tx Multicast (Packet/sec)		The Tx multicast packets per second
Rx Multicast (Packet/sec)		The Rx multicast packets per second
Tx Broadcast (Packet/sec)		The Tx broadcast packets per second
Rx Broadcast (Packet/sec)		The Rx broadcast packets per second
Tx Packet Error		The number of Tx packet error
Rx Packet Error		The number of Rx packet error

Port Setting

The Port Setting allows some switch port settings to be changed. Use the right/left buttons to select a switch port and click the **Activate** button to save the change.



Field	Values	Description
Port Index	Port x	Selected port number
Speed	Auto 10/Half 10/Full 100/Half 100/Full	Selected port speed and mode
Enable	Enable Disable	Selected port enable or disable