LANTRONIX

# CoBox Setup Records

## Documentation

Version 1.33

LANTRONIX

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## Revision History

| Rev | Date | Initials | Notes |
|---|---|---|---|
| 1.7 | 1/31/03 | jl | Current revision in CVS |
| 1.8 | 2/07/03 | dam | Added setup record 5,6 &7 information, new for XPort development. General updates/corrections. |
| 1.9 | 2/27/03 | pa | add echo bit, correct Flush Mode, add reboot byte |
| 1.10 | 4/10/03 | dam | add “warning” to users about reserved bytes |
| 1.11 | 6/24/03 | pt | Added 192 and 256 bit AES key storage to setup record 1 |
| 1.12 | 8/23/03 | dam | Corrections to ‘Connect Configuration’ option descriptions; added 77F0 security flag in record 1 |
| 1.13 | 10/24/03 | dam | Minor changes for Micro100; changed F7 description related to 2-channel indication; minor corrections |
| 1.14 | 2/09/04 | dam | New settings in setup records 0 & 3 for XPort-03 (EX based); other minor corrections |
| 1.15 | 6/28/04 | pt | WiPort specific setup record (7 (different format), 8 and 9) descriptions added. |
| 1.16 | 7/02/04 | dam | XPort-485 specific settings added to setup record 7; new feature settings in setup record 3, first release in XPort-485; other minor corrections |
| 1.17 | 8/20/04 | pt | Correction and addition to WiPort setup record 7 |
| 1.18 | 9/16/04 | dam | Minor correction in FC example; |
| 1.19 | 5/18/05 | pt | Additions/changes for WPA |
| 1.20 | 7/8/05 | dam | Added record 4 information (based on WPA support) |
| 1.21 | 8/16/05 | vmk | Addition of MTU size config + reserved space in record 1 for Walgreens only configuration |
| 1.22 | 8/16/05 | Vmk | Addition of the F4/F5 query/response to extended version and rcr/scr reporting. |
| 1.23 | 8/29/05 | dam | Add Alternate MAC info in records 1 & 4; Modem Mode escape sequence control in record 3; Ethernet speed & duplex configuration in record 3; Changes to Modem Mode configuration in record 0. Add write of record 1 without security parameters, and ‘get mac’ monitor mode command |
| 1.24 | 9/19/05 | pt | Added low performance CPU mode<br>Added wifi changes for Marvell |
| 1.25 | 11/22/05 | dam | Added record 2 information |
| 1.26 | 6/20/06 | pt | Wiport record 7 active level bit meanings reversed |
| 1.27 | 7/24/06 | vmk | Bridging Configuration – Record 0 Byte 5 and configurable 77fe port number Record 3 Byte 80-81 |
| 1.28 | 7/24/06 | pt | 802.11i additions to record 8. Valid from 6.3.0.0 and up |
| 1.29 | 9/21/06 | kuwata/ | Added commands 10, 11, 12, 13, & 14 for ITM |

| | | | |
|---|---|---|---|
| | | dam | products; |
| 1.30 | 10/02/06 | snguyen | Added 15 command (Call home feature) for ITM products; |
| 1.31 | 01/09/06 | vmk | Added Reset to Default – Wired CP option for WiPort |
| 1.32 | 01/15/07 | dam | Added XPort Direct setup record 7 info |
| 1.33 | 02/12/07 | dam | Added Monitor Mode commands SA & NS; Added new feature information for v6.5; MatchPort b/g setup record 7 info; |

# 1. Summary

Based on the hardware platform the Lantronix CoBox device server may have more or less memory for Setup storage. Only the standard setup record is available for sure. All further setup records besides the first 120 bytes are optional depending on the used hardware platform. The following possibilities exist:
1 x 120 Bytes
Or
1x 120 Bytes & 1x 126 Bytes
Or
1x 120 Bytes & 7x 126 Bytes
Or
1x 120 Bytes & 15x 126 Bytes

This document describes how to query and how to change parameters in the different records over the serial interface or over the network. The construction of the individual setup records is described as well. However, since all products do not support the full set of features, please refer to the corresponding manual for specific features and settings information.

# 2. Configuration over network

With sending a specific UDP data record to port 77FEh or by establishing a TCP connection to port 77FEh and then sending the data record, you can query and set all the setup records in an easy way.

The construction of the data record looks like the following:
00 00 00 <command> <… additional data or parameter>

The 2nd Byte of the data record is used to decide if the Device reboot or not. So if the device should reboot we have the followed data record:
00 00 00 <command>…
not reboot :
00 01 00 <command>…

Basically we have 3 bytes set to 00h followed by a command byte, depending on the command there will be additional parameters necessary or some data will be delivered in an answer. Most commands invoke an answer sent out by the receiver.

An important fact to keep in mind, for the setup features, is that the setup is received or sent in strict binary format. That means the standard record of 120 bytes is sent/received as 120 bytes. The other setup records, which all have a length of 126 bytes, are sent/received with this length.

Table of commands:

| Command Byte | Function & Parameters/Data |
|---|---|
| 03 | **Node Reset:** Parameter needs to be the software type for the specific CoBox application. For example, 33h 51h ( =”3Q”) or 58h 31h ( =”X1”). |
| F4 | **Exended Version & RCR/SCR Query:** There are no additional parameters required. The response to the query will be with a F5 message. |
| F5 | **Extended Version & RCR/SCR Response:** The parameters in the response are encoded as follows: first **12** bytes of the response are reserved for Lantronix usage. The next **16** bytes are used to report the extended version number. It is a string that could be less than 16 bytes including the ‘\0\ character. However a total of 16 bytes is sent over the network to keep the offsets into the remaining parameters constant. The next parameter is a byte indicating the number of web pages provided by the product. |
| F6 | **Query of firmware version:** No parameters; answer comes with an F7-message (see below) |
| F7 | **Answer for F6:** As parameter follows a total of 26 bytes: the 1st 16 bytes of the firmware image, which contain the version, checksum and device type. After that follow 4 bytes of serial info and 6 bytes MAC address. To check if the device is a one channel or a two channel the low nibble in |

| | |
|---|---|
| | the third byte of the MAC address is decisive. If this is a 2 or 3 → 2 channel device, in all other cases → 1 channel device.<br>Note for XPort & Micro100: the 4 bytes of serial info are returned as 1 byte with the OEM type and 3 bytes of 00, since serial number is not supported. Regardless of MAC address, XPort is a single channel device and Micro100 is a 2-channel device. |
| F8 | **Query of configuration:** no parameters; answer comes with an F9-message (see below). This command is only applicable for the standard setup record (120 bytes). |
| F9 | **Answer for F8:** As parameter follows the complete setup record (120 bytes) in binary format. |
| FA | **Set configuration:** As parameter the complete standard setup record has to be sent (120 bytes). The IP address will not be changed (bytes 0…3). |
| FB | **Answer for FA and FD:** After sending this message, the node makes a reset to initialise itself with the new configuration. |
| FC | **Set IP address:**<br>Parameter: the 1st 8 Byte **must** contain the ASCII-sequence„**IP-SETUP“**<br>(Hex 49 50 2D 53 45 54 55 50).<br>The next 2 bytes have to be set to 00<br>The next 2 bytes must contain the last 2 bytes of the MAC Address<br>The next 4 bytes have to be the NEW IP-address<br>This block can be sent as a broadcast, because the MAC address is unique. There exists no acknowledge for this block. After setting the IP-address the node makes a reset.<br>Example (all in hex):<br>49 50 2D 53 45 54 55 50 00 00 2A 12 81 00 01 02<br>IP address of the node with - MAC address xx-xx-xx-xx-2A-12 set to 129.0.1.2 |
| FD | **Set configuration:** As parameter the complete setup record has to be sent (120 bytes). The IP address will also be changed (bytes 0…3). |
| E0 to EF | **Query of configuration:** With these commands all setup records including the standard record can be queried. The second nibble of the Command, ‘0’ to ‘F’ represents the number of the setup record. |
| D0 to DF | **Answer to query of configuration (E0 to EF):** As parameter follows the complete appropriate (depending on the initiated command) setup record (120 bytes or 126 bytes) in binary format. D1 always returns 00 in the record, as this record is reserved for security features. D0 will return the standard setup record (120 bytes) |
| C0 to CF | **Set configuration:** With this command all setup records including the standard record can be set. The second nibble of the Command, ‘0’ to ‘F’ represents the number of the setup record. CO needs 120 bytes as parameter and C1 to CF need 126 bytes as parameter. |
| B0 to BF | **Answer to Set configuration (C0 to CF):** No parameter follows. |
| A1 | **Set Security Record:** With this command the security setup record 1 can be written (e.g. to change the security flags) without having to include the encryption key information, which includes the key and key length. Specifically bytes 1-16, 49, and 50-65 remain ‘unchanged’. Answers with |

a **B1** response.

A0 **Reserved for ITM**

10 **Query of port list:**

All available ports on a specific device by its IP address can be queried; no parameters; answer comes with an 11-message (see below)

11 **Answer for 10:**

A response to 10 request command, it reports all available ports on responded device with information in structures format of:

| Address (byte) | Function |
|---|---|
| 00...02 | 00 00 00 |
| 03 | Command (11) |
| 04…67 | 64 bytes for hostname in string |
| 68 | Flag |

| Bit | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|
| SLC01612N | | | | | 0 | 0 | 0 | 1 |
| SLC03212N | | | | | 0 | 0 | 1 | 0 |
| SLC04812N | | | | | 0 | 0 | 1 | 1 |
| SLC01622N | | | | | 0 | 1 | 0 | 0 |
| SLC03222N | | | | | 0 | 1 | 0 | 1 |
| SLC04822N | | | | | 0 | 1 | 1 | 0 |
| SLC01624T | | | | | 0 | 1 | 1 | 1 |
| SLC03224T | | | | | 1 | 0 | 0 | 0 |
| SLC04824T | | | | | 1 | 0 | 0 | 1 |
| SLC00812N | | | | | 1 | 0 | 1 | 0 |
| SLC00822N | | | | | 1 | 0 | 1 | 1 |
| SLC00824T | | | | | 1 | 1 | 0 | 0 |
| Web telnet enabled | | | | 1 | | | | |
| Web SSH enabled | | | 1 | | | | | |
| Telnet enabled | | 1 | | | | | | |
| SSH enabled | 1 | | | | | | | |

| | |
|---|---|
| 69… | Port records |

Follow by variable length containing number of port records, however max number of records is 48, each port record with a fixed length of 35 bytes indicate below,

**Port Record:**

| Address (byte) | Function |
|---|---|
| 00 | Flag |

| Bit | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|
| Telnet enabled | | | | | | | | 1 |
| SSH enabled | | | | | | | 1 | |

| | |
|---|---|
| 01 02 | Telnet port number |
| 03 04 | SSH port number |
| 05…08 | IP address |
| 09…38 | 30 bytes for port name |

<table>
<tr><td>12</td><td>Query of configuration: Network record on a specific device by its MAC address. This block can be sent as a broadcast, because the MAC address is unique; answer comes with a 13-message (see below).<br><br>Network Record:
<table>
<tr><th>Address (byte)</th><th>Function</th></tr>
<tr><td>00...02</td><td>00 00 00</td></tr>
<tr><td>03</td><td>Command (12)</td></tr>
<tr><td>04 05</td><td>Header (80 01)</td></tr>
<tr><td>06 07</td><td>Length of record (00 0E)</td></tr>
<tr><td>08 09</td><td>MAC (Last 2 byte)</td></tr>
<tr><td>10…13</td><td>IP Address</td></tr>
<tr><td>14…17</td><td>Subnet mask</td></tr>
<tr><td>18…21</td><td>Default gateway</td></tr>
</table></td></tr>
<tr><td>13</td><td>Answer for 12: A response to 12 request command. As parameter follows the complete network record (22 bytes). See the 12 command for network record.</td></tr>
<tr><td>14</td><td>Set configuration: Set network record on specific device by its MAC address. This block can be sent as a broadcast, because the MAC address is unique. As parameter the complete network record has to be sent (22 bytes). See the 12 command for network record. “0.0.0.0” for subnet mask means that default subnet mask will be used. “0.0.0.0” for default gateway means that default gateway is unchanged.</td></tr>
<tr><td>15</td><td>Call home feature:<br>A remote SLC at power up will send a “Call-Home Feature frame” to “Call-Home Feature IP” – SLM that assigned with this IP will then receive this frame and add SLC information into its data base as a new SLC detected entry. (Assume that there is no limitation due to firewall, and/or SLM is at DMZ location, etc…).<br>• Call-Home-Feature frame: is an UDP frame base on 77FE protocol with extended information to contain all information about SLC and it ports (Basically a combination of F7 and A1 response command).<br>• Call-Home Feature IP: is an IP that registered and assigned by ARIN</td></tr>
</table>

**Note**: The block of **commands 10 through 4F** have been allocated to **ITM products** (IT/Data Center Management).

# 3. Configuration over the serial interface

For querying and setting the records over the serial interface, the CoBox must be set into Monitor Mode (refer to the CoBox manual). In this mode there is a variety of commands available. Some of them are used for querying and setting the configuration records. However, since some products do not support the full set of commands, refer to the corresponding manual for specific Monitor Mode information.

Communication is done in a command-response scheme. All commands will be acknowledged with a result code and prompt.

Most commands can be followed by an IP address, to specify a remote node.

## 3.1. Intel HEX format

All sent/received data is represented in the Intel HEX format.
With this format, arbitrary 8-bit binary data can be sent and received. The transmission is blocked in records, and every record has its own checksum.

### 3.1.1. Record format

Beginning with ´:´ the record consists of block length (2-character HEX), followed by a 16-bit address (4-character HEX) and a block type (2-characters HEX). Then all data bytes are transmitted as 2-character HEX values, followed by the checksum (2-character HEX). It is built by adding all binary 8-bit values and taking the complement, so adding all byte values (including length, address and type) should yield 0.

NOTE: Caution should be taken when checking/changing any bytes marked as “Reserved”. These reserved values could very well change in a future release.

### 3.1.2. Example

| | |
|---|---|
| **:00000001FF** | End record, type 01, length 00, address 00 00, checksum FF |
| **:01002000805F** | Data record consisting of one byte (value 80hex) for address 0020 (32dez). |

For communication with the node, the following types are defined:

| | |
|---|---|
| **00** | Data block program memory (firmware) |
| **01** | End record |
| **10** | Data block configuration memory |

To get and set the node configuration, 120/126 bytes should be exchanged at once in 32-Byte records.

## 3.2. Commands

**List of commands:**

| | |
|---|---|
| **DL** | Firmware download, take following records as new firmware |
| **SF** | Copy firmware to node with IP x.x.x.x (parameter) |
| **RS** | Reset node |
| **VS** | Query version. Answers with a single record (16 bytes) |
| **GC** | Get configuration. Node sends hex-records. |
| **G0 to Gf** | Get configuration (!!! Case sensitive) |
| **SC** | Set configuration. Node accepts configuration in hex-records. |
| **S0 to Sf** | Set configuration (!!! Case sensitive) |
| **PI** | Ping IP address x.x.x.x, to check if reachable over the network |
| **SN** | Get Serial number. Answers with a single record (9 bytes) |
| **GM** | Get MAC address. Answers with the complete 6-byte MAC |
| **SS** | Set Security record without the encryption key & length parameters. The entire record must still be written, but the encryption specific bytes (1-16, 49, 50-65) do not need to be provided (i.e. they are not overwritten). |
| **NC** | Get Network configuration |
| **AT** | Get ARP table |
| **TT** | Get table of TCP sockets |
| **QU** | Quit diagnostics mode |
| **co** | Set IP address, hostbits and gateway IP Example:<br>co 192.168.0.10 8 192.168.0.1 10001<br>with<br>192.168.0.10 = IP address of CoBox<br>8 = number of hostbits<br>192.168.0.1 = gateway IP address<br>10001 = port number of CoBox<br>CoBox stores the setup and makes a reset.<br>An 'X' is sent by the CoBox before the reset if command was OK |
| **SA** | Scan initiates a wireless scan if the wireless interface is enabled. Reports any stations found, including BSSID, SSID, and RSSI. If SA is followed by a string, the string is used to filter SSIDs before reporting. If the BSS does not broadcast its SSID, only the BSSID and RSSI are returned. |
| **NS** | Network Status reports the network interfaces' statuses. Includes potentially negotiated parameters like speed/duplex for Ethernet or BSSID, encryption, authentication for wireless interfaces. |

Functions SF and PI must be accompanied by an IP address, and work only for remote nodes.
Functions RS, VS, GC and SC can be given with an IP address. In that case, the command is executed at the remote node (if reachable and switched on).

The node generates records with a maximum of 32 bytes.

Prompt character: ´>´

Acknowledge with error code directly before the prompt, codes:

0 - OK, no error
1 - Remote is not responding
2 - Remote node not reachable
8 - Wrong parameters
9 - Invalid command

## Example:

*
**xx1**
*** NodeSet 1.0 ***
0>**VS**
:1000000000104003335110000A00E00000000272113
0>

**Construction of VS answer:**
Bytes 3 and 4 are the firmware version with byte 3 = the 2nd part of the version and byte 4 = 1st part of the version.
In the example above the version is 3.40.

Bytes 5 and 6 are the destination filename for a firmware download via TFTP. For this particular CoBox this is 3Q = 33 51(hex).

# 4. Setup records

## 4.1. Setup record 0

The first setup record consists of 120 bytes. This is the standard record, which is available in each hardware platform. Unused bytes should be initialized as ”00”.

**Address** **Function**

00…03 IP address of the unit
04 Reserved, (0)
05 Flag BYTE
Bit 7 Reserved, 0
Bit 6 Set 1 for AUI, 0 for 10/100BaseT/BNC (ignored for -mini)
Bit 5..3 Reserved, 0
Bit 2 Set 1 for Bridging Mode(Single Host) WiPort only, 0 Non Bridging
Bit 1,0 Reserved, 0
06 Number of host bits for subnetting; if 0, standard netmask for class A, B, C is used
07 TCP Keepalive valid range: 1 – 65; FFh = disabled
08…11 Telnet configuration password, 0 if not used
12…15 Gateway IP address (0,0,0,0 if not used)
16…63 48-byte channel 1 parameters: parameter setup channel 1, used as following:

16 Line interface mode, calculated as:

| Bit | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|
| RS-232C | | | | | | | 0 | 0 |
| RS-422/485 | | | | | | | 0 | 1 |
| RS-485 2-wire | | | | | | | 1 | 1 |
| 7 Bit | | | | | 1 | 0 | | |
| 8 Bit | | | | | 1 | 1 | | |
| No parity | | | 0 | 0 | | | | |
| Even Parity | | | 1 | 1 | | | | |
| Odd Parity | | | 0 | 1 | | | | |
| 1 Stop bit | 0 | 1 | | | | | | |
| 2 Stop bit | 1 | 1 | | | | | | |

17 Line speed
Bit 7…5 Reserved
Bit 4…0 Baud rate, coded:

| Value | bps | Remarks |
|---|---|---|
| 00 | 38400 | |
| 01 | 19200 | |
| 02 | 9600 | |

| | | |
|---|---|---|
| 03 | 4800 | |
| 04 | 2400 | |
| 05 | 1200 | |
| 06 | 600 | |
| 07 | 300 | |
| 08 | 115200 | |
| 09 | 57600 | |
| 0A | 230400 | |
| 0B | 460800 | |
| 0C | 921600 | |

18 Flow control

| | |
|---|---|
| 00 | No flow control |
| 01 | XON/XOFF flow control in both directions |
| 02 | Hardware handshake with RTS/CTS lines (not Mini Rev. 1) |
| 05 | XON/XOFF, pass characters to host |

19 Reserved
20..21 Own TCP port low-byte, high-byte (Intel)
22..23 Remote TCP port low-byte, high-byte (Intel)
24..27 Remote IP address (low/high), except when UDP Broadcast is selected, then the IP address is set to all FFs (as of v6.5.0.0)

28 Connect configuration, bit coded:

| Option | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|
| Connection acceptance | | | | | | | | |
| Never accept incoming | 0 | 0 | | | | | | |
| Accept incoming with active DTR only (not Mini Rev. 1) | 0 | 1 | | | | | | |
| Accept unconditional (if not busy) | 1 | 1 | | | | | | |
| Use hostlist | | | 1 | | | | | |
| Response on serial to connect | | | | | | | | |
| Nothing (quiet) | | | | 0 | | | | |
| Character response (C = connect, D = disconnect, N = not available/unreachable) | | | | 1 | | | | |
| Active connection startup | | | | | | | | |
| No active connection start-up | | | | | 0 | 0 | 0 | 0 |
| Start connection with any character on serial line | | | | | 0 | 0 | 0 | 1 |
| Start connection with active-going DTR line | | | | | 0 | 0 | 1 | 0 |
| Start connection with a specific character on serial line | | | | | 0 | 0 | 1 | 1 |
| Manual connection start-up (`C´ + address) | | | | | 0 | 1 | 0 | 0 |
| Autostart outbound connection | | | | | 0 | 1 | 0 | 1 |
| Hostlist | 0 | 0 | 1 | 0 | | | | |
| Datagram Type | | | | | | | | |
| Directed UDP | . | | | | 1 | 1 | 0 | 0 |
| Modem Mode | | | | | | | | |
| With Echo | | | | 1 | | 1 | 1 | |
| Without Echo | | | | 0 | | 1 | 1 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Modem result codes | | | | | 1 | 1 | 1 | |
| Textual modem result codes | | | | | | 1 | 1 | 0 |
| Numeric modem result codes | | | | | | 1 | 1 | 1 |

29 Disconnect configuration

| Bit | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|
| Disconnect with DTR drop | 1 | | | | | | | |
| Ignore DTR | 0 | | | | | | | |
| Terminal type for telnet set/queried | | 1 | | 0 | | | | |
| Channel (port) password required | | 0 | | 1 | | | | |
| Hard disconnect | | | | | 0 | | | |
| Disable hard disconnect | | | | | 1 | | | |
| State LED off with connection | | | | | | | | 1 |
| Check for CTRL-D to disconnect | | | 1 | | | | | |

30 Disconnect with inactivity timeout, minutes, 00 if unused
31 Disconnect with inactivity timeout, seconds, 00 if unused
32..33 Characters to trigger send immediately (sendchar)
34 Flush mode, bit coded:

| Bit | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|
| Input buffer (serial line -> network) | | | | | | | | |
| Clear with active connect (through serial): | | | | 1 | | | | |
| Clear with passive connect (from network): | | | 1 | | | | | |
| Clear at time of disconnect: | | 1 | | | | | | |
| Output buffer (network -> serial line) | | | | | | | | |
| Clear with active connect: | | | | | | | | 1 |
| Clear with passive connect through network: | | | | | | | 1 | |
| Clear at time of disconnect | | | | | | 1 | | |
| Alternate Packing Algorithm | 1 | | | | | | | |

All functions can be selected independently from each other.

35 Pack-Ctrl-Byte

| Function | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|
| Idle time to force transmit: 12 ms (avg.) | | | | | | | 0 | 0 |
| Idle time to force transmit: 52 ms (avg.) | | | | | | | 0 | 1 |
| Idle time to force transmit: 250 ms (avg.) | | | | | | | 1 | 0 |
| Idle time to force transmit: 5 s (!) | | | | | | | 1 | 1 |
| No trailing chars after sendchar(s) | | | | | 0 | 0 | | |
| One trailing char after sendchar(s) | | | | | 0 | 1 | | |
| Two trailing chars after sendchar(s) | | | | | 1 | 0 | | |
| Sendchar define 2-Byte sequence | | | | 1 | | | | |
| Send immediate after Sendchar | | | 1 | | | | | |

36..47 Reserved, for the different UDP master/slave protocols (customized versions). Contains for example slave addresses

48..63 a) Terminal name for telnet terminal type option (15 characters max), 0-terminated
if set and bit 6 in disconnect mode is set, telnet connection will be assumed.
b) Password for „Passworded Socket Connection“ (bit 4 in disconnect mode set)

64…111 48 byte channel 2 parameters, same meaning as with channel 1

112…119 TokenRing hardware:
112..117 TR administered address; 118..119 Reserved, (0)

112…119 Ethernet hardware:
DHCP device name
(Since 5.1b5 and XPort 1.2, these are the first 8 bytes for the DHCP name. Since then we support up to 16 bytes for the name, the second part is in Setup record 3)

### 4.1.1. Serial usage

Before V4.3:
Query GC
Set SC

Since V4.3:
Query GC or G0
Set SC or S0

### 4.1.2. Network usage

Before V4.3:
Query F8
Set FA (without changing the IP address)
Set FD (with changing the IP address)

Since V4.3:
Query F8 or E0

| | |
|---|---|
| Set | FA (without changing the IP address) or C0 |
| Set | FD (with changing the IP address) |

## 4.2. Setup record 1

This record is reserved for security parameters. That means there are some restrictions on reading this setup record. Basically this setup record is “write-only”.

| Address | Function |
|---|---|
| 00 | Security flags<br>Bit 7 reserved, 0<br>Bit 6 1=SNMP disabled<br>Bit 5 1=Web Server disabled<br>Bit 4 1=Port 77FEh disabled<br>Bit 3 1=Enhanced password enabled<br>Bit 2 1=Encryption enabled<br>Bit 1 1=TFTP disabled<br>Bit 0 1=Telnet Setup disabled |
| 01…16 | Twofish or AES key (16 byte = 128 bit) |
| 17…33 | 16 byte enhanced password + Null terminator |
| 34…47 | SNMP Community 13 byte + Null terminator (since 4.5b8 and XPort 1.2) |
| 48 | Additional Security flags<br>Bit 7 1=WEB Setup disabled<br>Bit 6 not used (0)<br>Bit 5 (RESERVED – NOT IMPLEMENTED IN STANDARD CODE)<br>Ref: OCP Implementation # 2<br>Bit 4 not used (0)<br>Bit 3 not used (0)<br>Bit 2 not used (0)<br>Bit 1 1=Port 77F0h disabled<br>Bit 0 1=Echo enabled |
| 49 | Key length (in bytes) for AES. 16, 24 or 32 for 128, 192 or 256 bit keys, respectively |
| 50…65 | 2nd part AES key when using 192 or 256 bit keys |
| 66…79 | (RESERVED – NOT IMPLEMENTED IN STANDARD CODE) Ref: OCP Implementation # 3 |
| 80 | Bit 7…4 Reserved, must be 0<br>Bit 3 1=OEM MAC address enabled<br>Bit 2…0 Reserved, must be 0 |
| 81…114 | Reserved for OEM specific functionality & enhancements |
| 115…125 | not used |

### 4.2.1. Serial usage

| | |
|---|---|
| Since V4.3: | |
| Query | G1 (ATTENTION: will always return 00h for each setup byte) |
| Set | S1 |

#### 4.2.2. Network usage

Since V4.3:
Query E1 (ATTENTION: will always return 00h for each setup byte)
Set C1

## 4.3. Setup record 2

This setup record is used in specific applications.

| Address | Function |
|---|---|
| 00…05 | Reserved, 0 |
| 06…23 | Used by IAP CoBox products |
| 24…26 | not used |
| 27…59 | String name for serial port 1 |
| 60…92 | String name for serial port 2 |
| 93…125 | String name for the device |

#### 4.3.1. Serial usage

Since V4.3:
Query G2
Set S2

#### 4.3.2. Network usage

Since V4.3:
Query E2
Set C2

## 4.4. Setup record 3

This record is used for additional parameters added to the CoBox.

| Address | Function |
|---|---|
| 00 | Hostlist retry counter |
| 01…02 | Hostlist retry timeout |
| 03…74 | Hostlist, 12 entries each 4 byte IP + 2 byte port number |
| 75 | Start character serial channel 1 |
| 76 | Start character serial channel 2 |
| 77 | Ethernet Speed & Duplex |
| | Bit 7 reserved, 0 |
| | Bit 6 reserved, 0 |
| | Bit 5 reserved, 0 |
| | Bit 4 reserved, 0 |
| | Bit 3 reserved, 0 |
| | Bit 2 1=100 Mbps enabled |
| | Bit 1 1=10 Mbps enabled |
| | Bit 0 1=Full-duplex enabled, 0=Half-duplex enabled |

Note: Currently supported configuration values are as follows,
0 = Auto-negotiation (default)
2 = 10 Mbps half-duplex
3 = 10 Mbps full-duplex
4 = 100 Mbps half-duplex
5 = 100 Mbps full-duplex

| | |
|---|---|
| 78…79 | MTU Size (valid range 512 – 1400) (default = 1400; setup as 0x0000) |
| 80…81 | 0x77FE Service Port Number (Used in Wiport/WiBox Bridging V1)<br>Value of 0 – defaults to 0x77fe (port 30718). |
| 82…99 | not used |
| 100…101 | ARP cache timeout |
| 102…109 | DHCP name (the second 8 byte of the possible length of 16 byte) |
| 110…111 | HTTP port number |
| 112…113 | SMTP port number |
| 114…115 | (RESERVED – NOT IMPLEMENTED IN STANDARD CODE) Ref: OCP Implementation # 1 |
| 116 | Additional flags<br>Bit 7 1=High Performance enabled<br>Bit 6 1=Monitor Mode Entry @ Bootup disabled<br>Bit 5 1=Low Performance enabled<br>Bit 4 not used (0)<br>Bit 3 1=Send +++ in Modem Mode for channel 2 disabled<br>Bit 2 1=Send +++ in Modem Mode for channel 1 disabled<br>Bit 1 1=Auto Increment Source Port for Channel 2 enabled<br>Bit 0 1=Auto Increment Source Port for Channel 1 enabled |
| 117 | Bits 7…2 not used (0)<br>Bit 1 1=Send IP address after ring in Modem Mode for channel 2 Disabled (as of 6.5.0.0)<br>Bit 0 1=Send IP address after ring in Modem Mode for channel 1 disabled (as of 6.5.0.0) |
| 118…125 | not used |

#### 4.4.1. Serial usage

Since V4.3:

| | |
|---|---|
| Query | G3 |
| Set | S3 |

#### 4.4.2. Network usage

Since V4.3:

| | |
|---|---|
| Query | E3 |
| Set | C3 |

## 4.5. Setup record 4

This setup record is only supported in v6.x.x.x releases, and later; intended for use by OEMs to customize specific product strings/parameters, as described below. In

general, the bytes in addresses 0 through 32 are strictly reserved for use by Lantronix operational code, and available for an OEM to take advantage of these specific features. If not utilized, then bytes 33 through 125 remain available for general use (by anyone).

| Address | Function |
|---|---|
| 00…03 | OEM ID (to be assigned/distributed only by Lantronix) |
| 04…09 | OEM MAC address |
| 10 | Country Code (used in WiPort/WiBox products). 0=US, 1=FR, 2=JP, 3=OT(hers), 4=SP, 5=CA |
| 11…31 | Reserved (future use) |
| 32 | Length of configuration parameters (contained in subsequent bytes)<br>0 = no parameters (rest of record 4 is ignored by operational firmware)<br>>0 = total byte length of parameter fields used |
| 33…125 | For Lantronix or OEM use as follows:<br>Field 1: Setup Menu splash string; null terminated<br>Field 2: SNMP system description name; maximum 30 characters plus null terminator<br>Field 3: Initial single character, output on serial port at bootup; null terminated<br>Field 4: DHCP name; maximum 16 characters plus null terminator |

Note: If a string field (1, 2, or 3) is not to be used, simply specify 0xff as the first character (or only character, in the null terminated string).

#### 4.5.1. Serial usage

Since V4.3:
Query G4
Set S4

#### 4.5.2. Network usage

Since V4.3:
Query E4
Set C4

### 4.6. Setup record 5

This record contains specific e-mail notification parameters, used in conjunction with record 6.

| Address | Function |
|---|---|
| 00…03 | Mail server IP address |
| 04…52 | Recipient 1, 49-byte string (must include null terminator) |
| 53…101 | Recipient 2, 49-byte string (must include null terminator) |

102…125 Unit name, 24-byte string (must include null terminator)

#### 4.6.1. Serial usage

Query G5
Set S5

#### 4.6.2. Network usage

Query E5
Set C5

## 4.7. Setup record 6

This record contains additional e-mail notification parameters, used in conjunction with record 5.

| Address | Function |
|---|---|
| 00…23 | Domain name, 24-byte string (must include null terminator) |
| 24 | Trigger1 Mask, selects the configurable pins (1,2, or 3) to be used in this trigger condition (any combination):<br>Bit 7…3 Reserved, must be 0<br>Bit 2 1=CP3 used in trigger condition, 0=CP3 not used<br>Bit 1 1=CP2 used in trigger condition, 0=CP2 not used<br>Bit 0 1=CP1 used in trigger condition, 0=CP1 not used |
| 25 | Trigger1 Compare, selects the level of the configurable pins on which to trigger (any combination):<br>Bit 7…3 Reserved, must be 0<br>Bit 2 1=trigger on CP3 Active, 0=trigger on CP3 Inactive<br>Bit 1 1=trigger on CP2 Active, 0=trigger on CP2 Inactive<br>Bit 0 1=trigger on CP1 Active, 0=trigger on CP1 Inactive<br>Note: if none of the configurable pins is to be used in a trigger, that is the trigger Mask=0, then the Compare must be set to 0 |
| 26 | Trigger1 Serial state: 3=serial compare is off, 0=serial compare is on |
| 27…28 | Trigger1 Serial compare, 2-byte sequence |
| 29…52 | Trigger1 Message, 24-byte string (must include null terminator) |
| 53 | Trigger1 Priority: 3=normal, 1=high |
| 54…55 | Trigger1 Minimum interval (seconds): time required between two trigger conditions for a new notification, range: 0-65535 |
| 56…57 | Trigger1 Maximum interval (seconds): time required for original trigger condition to be present for a re-notification, range: 1-65535; 0=disabled |
| 58 | Trigger2 Mask, selects the configurable pins (1,2, or 3) to be used in this trigger condition (any combination):<br>Bit 7…3 Reserved, must be 0<br>Bit 2 1=CP3 used in trigger condition, 0=CP3 not used<br>Bit 1 1=CP2 used in trigger condition, 0=CP2 not used<br>Bit 0 1=CP1 used in trigger condition, 0=CP1 not used |
| 59 | Trigger2 Compare, selects the level of the configurable pins on which |

| | |
|---|---|
| | to trigger (any combination):<br>Bit 7…3 Reserved, must be 0<br>Bit 2 1=trigger on CP3 Active, 0=trigger on CP3 Inactive<br>Bit 1 1=trigger on CP2 Active, 0=trigger on CP2 Inactive<br>Bit 0 1=trigger on CP1 Active, 0=trigger on CP1 Inactive<br>Note: if none of the configurable pins is to be used in a trigger, that is the trigger Mask=0, then the Compare must be set to 0 |
| 60 | Trigger2 Serial state: 3=serial compare is off, 0=serial compare is on |
| 61…62 | Trigger2 Serial compare, 2-byte sequence |
| 63…86 | Trigger2 Message, 24-byte string (must include null terminator) |
| 87 | Trigger2 Priority: 3=normal, 1=high |
| 88…89 | Trigger2 Minimum interval (seconds): time required between two trigger conditions for a new notification, range: 0-65535 |
| 90…91 | Trigger2 Maximum interval (seconds): time required for original trigger condition to be present for a re-notification, range: 1-65535; 0=disabled |
| 92 | Trigger3 Mask, selects the configurable pins (1,2, or 3) to be used in this trigger condition (any combination):<br>Bit 7…3 Reserved, must be 0<br>Bit 2 1=CP3 used in trigger condition, 0=CP3 not used<br>Bit 1 1=CP2 used in trigger condition, 0=CP2 not used<br>Bit 0 1=CP1 used in trigger condition, 0=CP1 not used |
| 93 | Trigger3 Compare, selects the level of the configurable pins on which to trigger (any combination):<br>Bit 7…3 Reserved, must be 0<br>Bit 2 1=trigger on CP3 Active, 0=trigger on CP3 Inactive<br>Bit 1 1=trigger on CP2 Active, 0=trigger on CP2 Inactive<br>Bit 0 1=trigger on CP1 Active, 0=trigger on CP1 Inactive<br>Note: if none of the configurable pins is to be used in a trigger, that is the trigger Mask=0, then the Compare must be set to 0 |
| 94 | Trigger3 Serial state: 3=serial compare is off, 0=serial compare is on |
| 95…96 | Trigger3 Serial compare, 2-byte sequence |
| 97…120 | Trigger3 Message, 24-byte string (must include null terminator) |
| 121 | Trigger3 Priority: 3=normal, 1=high |
| 122…123 | Trigger3 Minimum interval (seconds): time required between two trigger conditions for a new notification, range: 0-65535 |
| 124…125 | Trigger3 Maximum interval (seconds): time required for original trigger condition to be present for a re-notification, range: 1-65535; 0=disabled |

### 4.7.1. Serial usage

| | |
|---|---|
| Query | G6 |
| Set | S6 |

### 4.7.2. Network usage:

| | |
|---|---|
| Query | E6 |
| Set | C6 |

## 4.8. Setup record 7

This record contains configurable pins settings. Two different formats are in use.

### 4.8.1. XPort, XPort-03, XPort-485

| Address | Function |
|---|---|
| 00 | CP1 option: CTS (0), IN1 (4), OUT1 (5), LED1 (10), RS485_TXEN (12), LINK_STATUS (13) |
| 01 | CP2 option: DCD (2), IN2 (6), OUT2 (7), RS485_TXEN (12), LINK_STATUS (13) |
| 02 | CP3 option: RTS (1), DTR (3), IN3 (8), OUT3 (9), LED3 (11), RS485_TXEN (12), LINK_STATUS (13) |
| 03…15 | Reserved (as of 6.5.0.3) |
| 16…122 | not used |
| 123 | LINK_STATUS signal level: 1=active high, 0=active low (as of 6.5.0.3) |
| 124 | RS485_TXEN signal level: 1=active high, 0=active low |
| 125 | User I/O signal level: 1=active high, 0=active low |

### 4.8.2. XPort Direct

| Address | Function |
|---|---|
| 00…01 | CP0…CP1<br>Bit 0-6 Function selection<br>0=General Purpose Input<br>1=General Purpose Output<br>2=Modem Ctrl Input channel 0<br><br>Bit 7 Active level<br>0=active low, 1=active high |
| 02…125 | not used |

### 4.8.3. WiPort (not WiBox)

| Address | Function |
|---|---|
| 00…10 | CP0…CP10<br>Bit 0-6 Function selection<br>0=General Purpose Input<br>1=General Purpose Output<br>2=Modem Ctrl Input channel 0<br>3=Modem Ctrl Output channel 0<br>4=Modem Ctrl Input channel 1 |

5=Modem Ctrl Output channel 1
6=Status LED channel 0
7=Status LED channel 1
8=Diagnostics LED
9=RS485 Selection
10=RS485 2 wire
11=General Purpose Input and Trigger input
12=Reset to defaults – Wireless
13=RS485 4 wire
14=Reset to defaults – Wired Ethernet

Bit 7 Active level
0=low active, 1=high active.

### 4.8.4. MatchPort b/g

| Address | Function |
|---|---|
| 00…04 | CP0…CP4<br>Bit 0-6 Function selection<br>0=General Purpose Input<br>1=General Purpose Output<br>2=Modem Ctrl Input channel 0<br>3=Modem Ctrl Output channel 0<br>4 Not supported<br>5 Not supported<br>6=Status LED channel 0<br>7 Not supported<br>8=Diagnostics LED<br>9=RS485 Selection<br>10=RS485 2 wire<br>11=General Purpose Input and Trigger input<br>12=Reset to defaults – Wireless<br>13=RS485 4 wire<br>14=Reset to defaults – Wired Ethernet<br><br>Bit 7 Active level<br>0=active low, 1=active high |
| 05…125 | not used |

### 4.8.5. Serial usage

Query G7
Set S7

### 4.8.6. Network usage

Query E7

Set C7

## 4.9. Setup record 8

This record contains specific wireless network interface parameters, used in conjunction with record 9. (Currently on WiPort and WiBox only)

| Address | Function | |
|---|---|---|
| 00 | Bit 0 | WiFi enable |
| | Bit 1-2 | TX Power level. 0=0dBm, 1=6dBm, 2=12dBm, 3=18dBm. |
| | Bit 3-5 | Transmission Data rate<br>0=1 Mbps, 1=2 Mbps, 2=5.5 Mbps, 3=11 Mbps,<br>4=18 Mbps, 5=24 Mbps, 6=36 Mbps, 7=54 Mbps. |
| | Bit 6 | Auto rate: 0 = fixed tx data rate, 1=auto tx data rate |
| | Bit 7 | Power management enable |
| 01 | Bit 0 | Ad Hoc network |
| | Bit 1-3 | Reserved |
| | Bit 4-7 | Ad Hoc network creation channel<br>Valid: US:1…11, FR: 10…13, JP:1…14,. OThers: 1…13,<br>SP: 10,11, CA: 1..11 |
| 02 | Bit 0-1 | Security suite<br>0=None, 1=WEP, 2=WPA, 3=802.11i/WPA2. |
| | Bit 2-4 | Authentication method<br>0=None, 1=Shared/PSK, 2-7= Reserved |
| | Bit 5-7 | Pairwise Encryption method<br>0=None, 1=WEP64, 2=WEP128, 3=TKIP, 4=CCMP,<br>5-7=Reserved |
| 03…35 | SSID | |
| 36…68 | Reserved | |
| 69 | Group Encryption Method<br>~~0=None,~~ 1=WEP64/128, ~~2=WEP128~~, 3=TKIP, 4=CCMP, 5-7=Reserved<br>Group encryption selection shall be equal to or lower than the pairwise encryption selection. | |
| 70 | Key length | |
| 71 | Key type<br>0=hex, 1=passphrase | |
| 72 | TX Key index for WEP only. Valid is 0 - 3 | |
| 73..125 | Reserved | |

### 4.9.1. Serial usage

Query G8
Set S8

#### 4.9.2. Network usage

Query E8
Set C8

## 4.10. Setup record 9

This record contains specific wireless network interface parameters, used in conjunction with record 8. (Currently on WiPort and WiBox only)

| Address | Function |
|---|---|
| 00…06 | Reserved |
| 07…70 | Encryption key in hex or passphrase |
| 71…125 | Reserved |

#### 4.10.1. Serial usage

Query G9
Set S9

#### 4.10.2. Network usage:

Query E9
Set C9

## 4.11. Setup record 10 to 15 (14 for WiPort/WiBox)

These setup records are not used yet.

| Address | Function |
|---|---|
| 00…125 | not used |

#### 4.11.1. Serial usage

Since V4.3:
Query G8 to Gf (!!! Case sensitive) (Ge for WiPort/WiBox)
Set S8 to Sf (!!! Case sensitive) (Se for WiPort/WiBox)

#### 4.11.2. Network usage

Since V4.3:
Query E8 to EF (EE for WiPort/WiBox)
Set C8 to CF (CE for WiPort/WiBox)