ProLinx COMMUNICATION GATEWAYS

CLVM

CLVM Driver

CLV Command Language Module

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2.40	First public release	2/14/03

Related Documents & Reference Materials

Several resources are available to assist with the configuration and support of the ProLinx Communication Gateways, Inc. modules. The following files are available off the ftp site:

Startup Guide	ftp://ftp.prosoft-technology.com/pub/prolinx/Protocol_Manuals/	
	Startup_guide_2.20.pdf	ProLinx Communication Gateways, Inc. Startup Guide

1 Introduction

The CLVM driver permits the ProLinx Communication Gateways, Inc. module to interface SICK barcode scanners using CLV to the many protocols and networks available. The driver supports one to four ports that provide accessibility from one to four independent serial networks.

1.1 General Specifications

- **Ports:** One to four ports to receive and/or transmit data
- **Receive buffer size**: 255 bytes
- **Receive termination:** Termination character
- **Receive database location:** 0 to 3896
- **Communication Configuration**
  - **Baud Rate:** 110 to 115,200
  - **Parity:** None, Odd, Even
  - **Data Bits:** 5 to 8
  - **Stop Bits:** 1 or 2
  - **RTS On and Off Timing:** 0 to 65535 milliseconds
  - **Minimum Response Delay:** 0 to 65535 milliseconds
  - **Hardware Handshaking:** RTS/CTS

Supports device type of CLV 41X, V1.10 H757 to V1.30 I415

1.2 Resources

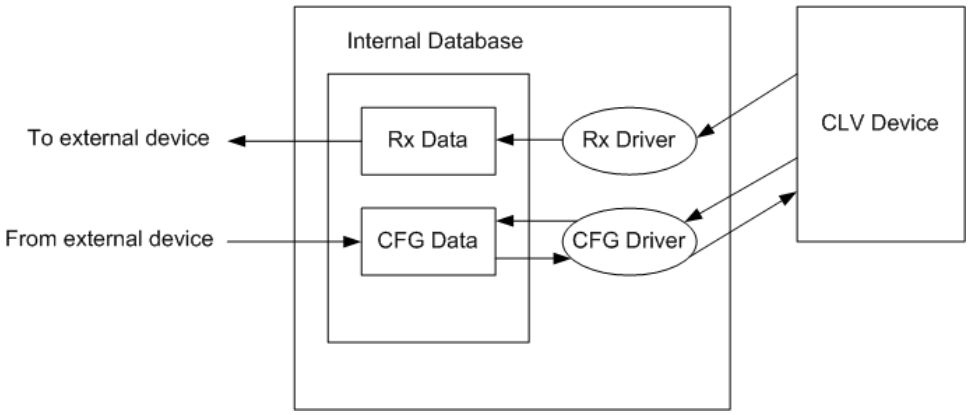
The *ProLinx Communication Gateways, Inc. Startup Guide* provides general information on all ProLinx modules including installation, editing configuration files, cabling and jumper configurations, troubleshooting, and a wide range of useful information. You should have this manual available when installing and configuring ProLinx modules.

2 Functionality

This section describes the functionality of the CLVM driver.

2.1 Data Flow

The following diagram displays receive and transmit dataflow of the CLVM driver.



Data received from the CLV device is accepted by the receive driver and placed in the receive database location configured by the user. The receive driver starts saving the characters when the start character is recognized. The receive driver waits until the user-configured termination condition is recognized while receiving the data before placing the new data into the database.

For example, if the ETX character (ASCII 13) is used as the termination condition for a received message, this signals the end of the message. When the receive driver observes this character in the input stream, it takes all received characters (starting from the start character) and places them in the internal database. If the module is configured as a master or client, it transfers this received data to an external device using commands programmed into the command list. If the module is configured as a slave or server, the external device can read this data directly from the module's database.

The data flow for configuration data from an external device to the CLV device is also shown in the previous diagram. If the module is configured as a master or client, it constantly reads the write data area in the external device and places the data in the configuration data area of the internal database. If the module is configured as a slave or client, the external device writes the configuration data to the configuration data area in the module's database. When the configuration driver is triggered to downlaod, it copies the data in the internal database into the transmit buffer and sends the new data to the CLV device.

In the receive operation, a signal is required to determine when new data is received. The first word in the data area is used for this purpose. When the value of the first word changes, new data is available. Lets look at a receive example. The sequence number in the receive data block has a value of 0 as set when the module initializes. The CLV device sends a new data

packet and the termination condition is present. The receive driver copies the data into the internal data area, sets the message length in the data area, and finally, sets the new sequence number. The receive data block structure is discussed in the following sections.

2.1.1 Receive Data

Data received by the receive driver is placed in the module's internal database in a fixed format at the location selected by the user. The following table shows the structure of the received data.

WORD OFFSET	DESCRIPTION
0	Receive sequence number. This register is incremented for each new packet received.
1	Number of characters (0 to 256) in receive block (2 to 129).
2 to 129	Received data on port.

The first word of the data block is used to signal when new receive data is available. Word 1 contains the number of bytes in the received message data area. Words 2 to 129 contain the data received. If the module is configured to swap the data bytes received, the receive driver will swap the bytes in each word received before placing the data into the data block. Because the data received may contain an odd number of bytes, the length of the message received will be incremented by 1 when an odd number of bytes are received and the swap option is utilized. This is to avoid loosing the last byte of data in the message.

2.1.2 Scanner Configuration Data

Data to transmit by the configuration driver is placed in the module's internal database in a fixed format at the location selected by the user. The configuration driver will download default data only if the configuration address is set to a value of –1. The following table shows the structure of transmit data.

2.1.2.1 Bit Map for Configuration Data

2.1.2.1.1 Code Configuration (Register 0 – 89)

Word\Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	Multiple Reads								Length Type					D	C	A
1	Length 2 (01-50)								Length 1 (01-50)							
2	Length 4 (01-50)								Length 3 (01-50)							
3									Length 5 (01-50)							
4	Code Spec 2 (01-7F)								Code Spec 1 (01-7F)							
5	Code Spec 4 (01-7F)								Code Spec 3 (01-7F)							
6	Code Spec 6 (01-7F)								Code Spec 5 (01-7F)							
7									Code Spec 7 (01-7F)							
8																

Parameter	**Value**
Activate Evaluation (A)	0 or 1
Check Digit (C)	0 or 1
Decoding Algorithm (D)	0 or 1
Length Type	1=LE, 2=LI, 3=LF
Multiple Reads	01-99
Length	01-50
Code Spec	0-4 depend on each code type*.

* Except EAN 128:	CodeSpec 1	range 0-1
	CodeSpec 2-7	range 01-7F (hex) or 001-127 (dec)

2.1.2.1.2 Device Configuration

Reading Configuration (Register 90 – 93)

Word\Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
90	Min Read Distance											Start/Stop				S
91	Min Bar Width								Scan Frequency							
92	Max Code Position								Min Code Position							
93	Absolute Value															

Parameter	Value
Min Read Distance	020-400
Min Bar Width	010-100
Scan Frequency	01 (dec) = ‘1’ (ascii) = 200 Hz. 02 (dec) = ‘2’ (ascii) = 250 Hz. 03 (dec) = ‘3’ (ascii) = 300 Hz. 04 (dec) = ‘4’ (ascii) = 350 Hz. 05 (dec) = ‘5’ (ascii) = 400 Hz. 06 (dec) = ‘6’ (ascii) = 450 Hz. 07 (dec) = ‘7’ (ascii) = 500 Hz. 08 (dec) = ‘8’ (ascii) = 550 Hz. 09 (dec) = ‘9’ (ascii) = 600 Hz. 10 (dec) = ‘:’ (ascii) = 650 Hz. 11 (dec) = ‘;’ (ascii) = 700 Hz. 12 (dec) = ‘<’ (ascii) = 750 Hz. 13 (dec) = ‘=’ (ascii) = 800 Hz.
Start/Stop	03 = ‘aa’ 04-11
Min Code Position	0-100
Max Code Position	0-100
Segmentation (S)	0 or 1
Absolute Value Idle Zone	1-255

Reading pulse (Register 95 – 98)

Word\Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
95									Mode				F	D	T	P
96	Trigger Start								Trigger Stop							
97	Time Out															
98	Timer															

Parameter	**Value**
Mode	1, 2, 3, 4, 8, and 10
Time Out	1-999
Pulse End (P)	0 or 1
Timer	1-9999
Trigger Single (T)	0 or 1
Trigger Start	01-7F (hex) or 001-127 (dec)
Trigger Stop	01-7F (hex) or 001-127 (dec)
Debounce (D)	0 or 1
First Pulse (F)	0 or 1

Switching Outputs (Register 100 – 109)

Word\Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
100	Result Duration 1											Switch Result 1				
101	Result Duration 2											Switch Result 2				
102	Result Duration 3											Switch Result 3				
103	Reference 2				Reference 1				Beeper Vol.			Beeper				
104	Limit1_4				Limit1_3				Limit1_2				Limit1_1			
105	Limit1_8				Limit1_7				Limit1_6				Limit1_5			
106	Limit2_4				Limit2_3				Limit2_2				Limit2_1			
107	Limit2_8				Limit2_7				Limit2_6				Limit2_5			
108	Fault 2				Fault 1				Invert Result							
109	Debounce counter															

Parameter	**Value**
Switch Result 1, 2, 3	0-19 where 10-19 use for A-J
Beeper	0-19 where 10-19 use for A-J
Result Duration 1,2, 3	1-999
Invert Result	0-7
Beeper Vol.	0-3
Reference 1	0-8
Fault 1	0 or 1
Limit1	0-99999999
Reference 2	0-8
Fault 2	0 or 1
Limit2	0-99999999
Debounce counter	

Matchcode Comparison (Register 110 – 161)

Word\Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
110	Match Code 2						F2	A2	Match Code 1						F1	A1
111	Teachin				Counter Reset				Code Type2				Code Type1			
112	Match Code Charater_1 2								Match Code Charater_1 1							
.	.								.							
.	.								.							
.	.								.							
136	Match Code Charater_1 50								Match Code Charater_1 49							
137	Match Code Charater_2 2								Match Code Charater_2 1							
.	.								.							
.	.								.							
.	.								.							
161	Match Code Charater_2 50								Match Code Charater_2 49							

Parameter	**Value**
Match Code1 Active (A1)	0 or 1
Code Type1	0-9
Match Code 1	1-50
Filter Match Code1 (F1)	0 or 1
Match Code2 Active (A2)	0 or 1
Code Type2 (T2)	0-9
Match Code 2	1-50
Filter Match Code2 (F2)	0 or 1
Teachin	0-2
Counter Reset	0 or 1
Match Code Charater_1 1-50	ASCII Characters
Match Code Charater_2 1-50	ASCII Characters

Device Number (Register 163)

Word\Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
163	Device Number															

Parameter	Value
Device Number	0-99

Master/Slave (Register 164 – 165)

Word\Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
164	Slave No.								Operating Mode							
165	Timeout															

Parameter	Value
Operating Mode	1-3
Timeout	0-9999
Slave No.	1-7

Choosing Parameter Profiles (Register 166)

Word\Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
166	Profile								Class							

Parameter	Value
Class	0=X 1=F 2=H
Profile	0-9

2.1.2.1.3 Host Interface

Data Format (Register 167)

Word\Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
167	Stop Bit					Data/Parity					Baud Rate					

Parameter	Value
Baud Rate	1-9
Data/Parity	1-7
Stop Bit	1-2

Output Format of Reading Result (Register 168 – 213)

Word\Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
168	Header 2								Header 1							
.	.								.							
172	Header 10								Header 9							
173	Separator 2								Separator 1							
.	.								.							
177	Separator 10								Separator 9							
178	Terminator 2								Terminator 1							
.	.								.							
182	Terminator 10								Terminator 9							
183	Code Length 2								Code Length 1							
	.								.							
187	Code Length 10								Code Length 9							
188	Format Mask 2								Format Mask 1							
.	.								.							
212	Format Mask 50								Format Mask 49							
213	Code Sequence															

Parameter	Value
Header 1-10	01-7F (hex) or 001-127 (dec)
Separator 1-10	01-7F (hex) or 001-127 (dec)
Terminator 1-10	01-7F (hex) or 001-127 (dec)

Code Length 1-10	0-50
Format Mask 1-50	0-92
Code Sequence	1-4

Error String (Register 215 – 230)

Word\Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
215	Status A				Status 5				Number							
216	Character 2								Character 1							
.	.								.							
230	Character 30								Character 29							

Parameter	Value
Number	0-50
Status 5	0 or 1
Status A	0 or 1
Character 1-30	01-7F (hex) or 001-127 (dec)

Interface Protocol (Register 231 – 234)

Word\Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
231	Block Check				Xon/Xoff				Type							
232	Send Stop								Send Start							
233	Receive Stop								Receive Start							
234	Timeout															

Parameter	Value
Type	1-7
Xon/Xoff	0 or 1
Block Check	0 or 1
Send Start	00-7F (hex) or 001-127 (dec)
Send Stop	00-7F (hex) or 001-127 (dec)
Receive Start	00-7F (hex) or 001-127 (dec)
Receive Stop	00-7F (hex) or 001-127 (dec)
Timeout	1-999

Test String (Register 235 – 243)

Word\Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
235	String 1								Active							
236	String 3								String 2							
.	.								.							
242	String 15								String 14							
243	Interval															

Parameter	Value
Active	0 or 1
String 1-15	01-7F (hex) or 001-127 (dec)
Interval	1-999

Sending Points (Register 244 – 245)

Word\Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
244	Minimum Distance													C	S	R
245	Maximum Number								Minimum Number							

Parameter	Value
Result (R)	0 or 1
Separator (S)	0 or 1
Comparison (C)	0 or 1
Minimum Distance	10-999
Minimum Number	1-10
Maximum Number	1-10

3 Modes of Operation

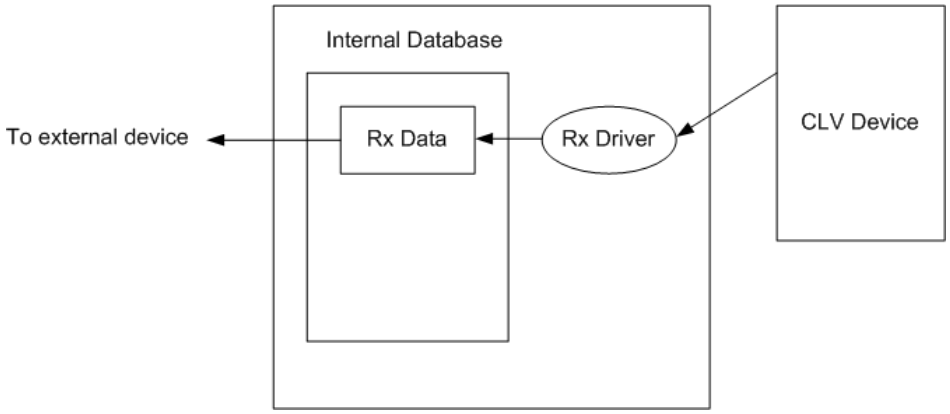
The module can operate in two different modes with each port acting independently. The configuration of each port's driver determines its mode of operation. The following sections describe these modes.

3.1 Data Flow

The following sections detail the flow of data between the pieces of hardware (CLV device and ProLinx Module). Each application port on the module is configured independently to interface with serial communication devices.

3.1.1 Receive Mode

A port on the module configured to function in receive mode is set up to only receive data from a CLV device. In this mode, the ProLinx module will never transmit data back to the CLV device. Any data received from the CLV device is passed from the receiver driver (Rx Driver) to the ProLinx module's internal database (Rx Data). The following diagram shows the flow of data on a port configured for receive mode.

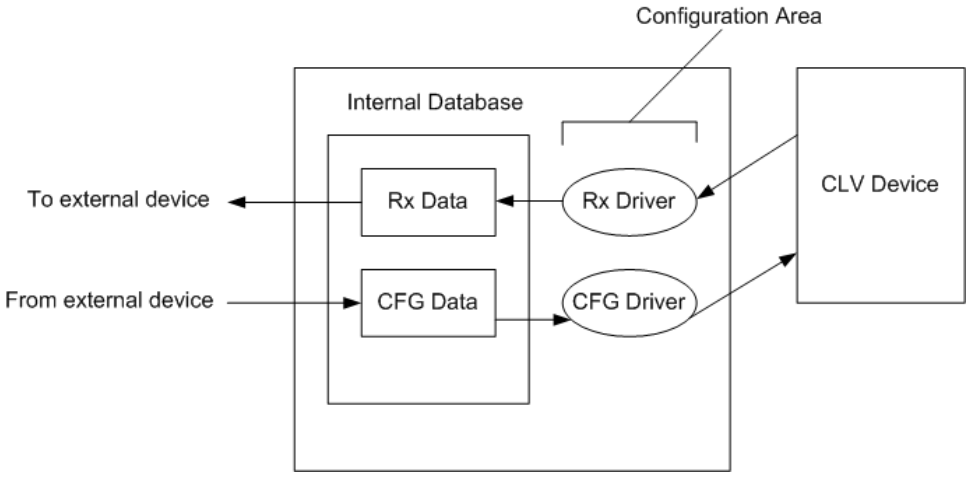


3.1.1.1 Configuring the Port for Receive Mode

In order to set a port for Receive mode, ensure that the **Rx DB Start** parameter in the configuration file contains the starting location of where the data will be stored.

3.1.2 Configuration Mode

A port configured in configuration mode can send and receive configuration data from a CLV device. Data flow to and from a CLV device is handled by the module's transmit and receive drivers. Data received from the CLV device is stored in the module's internal database in the configuration area. The following diagram shows the data flow when the port is configured for configuration mode:



3.1.2.1 Configuring a Port for Configuration Mode

In order to set a port to both receive data and transmit data to an CLV device, ensure that the **Configuration Address** parameter, the **Download** parameter, and the **Upload** parameter all contain values that specify data storage starting locations. A **–1** value in Configuration Address will disable all configuration values except downloading the default configuration.

3.1.2.2 Downloading a Configuration to a CLV Device

The download configuration database location is used to trigger configuration downloads to the CLV device. If the configuration address is set to –1, the default configuration will be sent to the CLV device. Otherwise, the data from the configuration section of the database will be sent. To download, set the Download database location to a 1 for permanent or a 2 for temporary. See section 2.1.2.1.1 for the data format. A value of 0 will disable the download.

3.1.2.3 Uploading a Configuration from a CLV Device

The upload database location is used to trigger an upload of the device configuration. To upload, set the upload location to 3. A value of 0 will disable the upload. The data uploaded will be placed in the database in the configuration area set by the Configuration Address parameter.

3.2 Start and Termination of Received Data

When data is received by the receive driver, the user must define in the configuration when this data will be transferred to the module's internal database. Within the driver, this is known as the start and termination type. When the termination condition is met, the data is sent from the port's receive buffer (data area of 255 bytes) to the module's internal database.

The start character is set in the RxStart Character parameter in the configuration file. The default is STX (ASCII 2). The termination character is set in the RxTerm Character parameter in the configuration file. The default is ETX (ASCII 3).

4 Driver Configuration

In order for the CLVM driver to function, a minimum amount of configuration data must be transferred to the module from the module's file system. Care must be taken in constructing the module configuration parameters. If the module does not function as expected, examine the configuration file using the Debugger Port on the module. All configuration parameters for the driver are found under the [CLVM Port x] section. The x in the section name will have a value of 0 to 3 corresponding to the appropriate CLVM port.

The following information provides an example of an CLVM configuration file:

```
# DFNTCLVM4.CFG
#
# This file contains the configuration for the DFNT/CLVM4 communication
# module.
#
# LOCATION      :
# DATE          : 02/10/2003
# CONFIGURED BY : Joe
# MODIFIED      :
#
# This section is used to define the configuration for the Module level
# data.
#
[Module]
Module Name : Test Example for 4202-DFNT-CLVM4 Communication Module


#-------------------------------------------------------------------------
-
# This section is used to define the configuration for the master device
# simulated on network port
#
[DFNT Client 0]
Minimum Command Delay   : 100    #Minimum number of msec's between commands
Response Timeout        : 1000   #Response messgage timeout (0-65535 mSec)
Retry Count             : 3      #Response failure retry count

[DFNT Client 0 Commands]
#
# The file contains examples for a ControlLogix processor with the N7 file
# configured.  This example uses SLC and PLC5 commands on client 0 and client 1
# respectively.
#
# LOCATION      :
# DATE          : 10/23/2002
# CONFIGURED BY : Joe
# MODIFIED      :
#
#   1     2      3     4    5  6                  7    8    9   10   11   12
#        DB   Poll       Swap                      Func File File  Elm  Sub
#Enab  Addr  Delay Count Code  Node IP Address Slot Code Type    #    #  Elm
START
#    1   200      0    10    0  192.168.0.149     -1  509    N   10    0
#    1   220      0    10    0  192.168.0.149     -1  509    N   10    0
END


[DFNT Client 1]
```

```
Minimum Command Delay   : 50     #Minimum number of msec's between commands
Response Timeout        : 1000   #Response messgage timeout (0-65535 mSec)
Retry Count             : 3      #Response failure retry count

[DFNT Client 1 Commands]
#
#        DB   Poll       Swap                          Func File  Elm  Sub
#Enab  Addr  Delay Count Code  Node IP Address Slot Code    #    #  Elm
START
#    1    50      0    10    0  192.168.0.101     -1  101    7    0   -1
END


#-------------------------------------------------------------------------------
-
# This section is used to define the configuration for the CLVM master device
# simulated on Port 0.
#

[CLVM Port 0]
Enabled                 : Yes    #Y=Use port, N=Do not use port
Baud Rate               : 9600   #Baud rate for port 300-57600
Data Bits/Parity        : 1      #1=8/none,2=8/even,3=7/even,4=8/odd,5=7/odd
Stop Bits               : 1      #1 or 2
RTS On                  : 0      #0-65536 mSec before message
RTS Off                 : 0      #0-65536 mSec after message
Use CTS Line            : No     #Use CTS modem control line (Y/N)

Rx DB Start             : 0
Swap Rx Data Bytes      : N
Rx Start Character      : 2      #Defaults to STX (2)
Rx Term Character       : 3      #Defaults to ETX (3)
Download Param          : 120    #0-3999
Upload Param            : 140    #0-3999
Configuration Address   : 1000   #-1 to disable


#-------------------------------------------------------------------------------
-
# This section is used to define the configuration for the CLVM master device
# simulated on Port 1.
#

[CLVM Port 1]
Enabled                 : Yes    #Y=Use port, N=Do not use port
RS Interface            : 0      #0=RS-232, 1=RS-485, 2=RS-422
Baud Rate               : 9600   #Baud rate for port 300-57600
Data Bits/Parity        : 1      #1=8/none,2=8/even,3=7/even,4=8/odd,5=7/odd
Stop Bits               : 1      #1 or 2
RTS On                  : 0      #0-65536 mSec before message
RTS Off                 : 0      #0-65536 mSec after message
Use CTS Line            : No     #Use CTS modem control line (Y/N)

Rx DB Start             : 1100
Swap Rx Data Bytes      : N
Rx Start Character      : 2      #Defaults to STX (2)
Rx Term Character       : 3      #Defaults to ETX (3)
Download Param          : 220    #0-3999
Upload Param            : 220    #0-3999
Configuration Address   : 1500
```

```
#-------------------------------------------------------------------------
-
# This section is used to define the configuration for the CLVM master device
# simulated on Port 2.
#

[CLVM Port 2]
Enabled                   : Yes    #Y=Use port, N=Do not use port
RS Interface              : 0      #0=RS-232, 1=RS-485, 2=RS-422
Baud Rate                 : 9600   #Baud rate for port 300-57600
Data Bits/Parity          : 1      #1=8/none,2=8/even,3=7/even,4=8/odd,5=7/odd
Stop Bits                 : 1      #1 or 2
RTS On                    : 0      #0-65536 mSec before message
RTS Off                   : 0      #0-65536 mSec after message
Use CTS Line              : No     #Use CTS modem control line (Y/N)

Rx DB Start               : 1200
Swap Rx Data Bytes        : N
Rx Start Character        : 2      #Defaults to STX (2)
Rx Term Character         : 3      #Defaults to ETX (3)
Download Param            : 320    #0-3999
Upload Param              : 320    #0-3999
Configuration Address     : 2000

#-------------------------------------------------------------------------
-
# This section is used to define the configuration for the CLVM master device
# simulated on Port 3.
#

[CLVM Port 3]
Enabled                   : Yes    #Y=Use port, N=Do not use port
RS Interface              : 0      #0=RS-232, 1=RS-485, 2=RS-422
Baud Rate                 : 9600   #Baud rate for port 300-57600
Data Bits/Parity          : 1      #1=8/none,2=8/even,3=7/even,4=8/odd,5=7/odd
Stop Bits                 : 1      #1 or 2
RTS On                    : 0      #0-65536 mSec before message
RTS Off                   : 0      #0-65536 mSec after message
Use CTS Line              : No     #Use CTS modem control line (Y/N)

Rx DB Start               : 1300
Swap Rx Data Bytes        : N
Rx Start Character        : 2      #Defaults to STX (2)
Rx Term Character         : 3      #Defaults to ETX (3)
Download Param            : 420    #0-3999
Upload Param              : 420    #0-3999
Configuration Address     : 2500

#-------------------------------------------------------------------------
-
# This section is used to define e-mail reports to be sent from the module
# to a specified e-mail server/user account based on the value of selected
# user register/value combinations.  When the specified register value contains
# the value defined, the e-mail file will be sent from the module.

[E-MAIL]
#    DB   Trigger     Mail          TO
#   Reg     Value     Server IP     Name          E-Mail File Name
START
#     50         1     192.168.0.61  rich          stat
#     50         2     192.168.0.61  rich          commands
#     50         3     192.168.0.61  rich          errlist
```

```
#     50         4     192.168.0.61  rich          emailcfg
#     50         5     192.168.0.61  rich          example.rpt
END


#------------------------------------------------------------------------------
-
# This section is used to move data within the database to concentrate
information
# for simpler data requests and control.  The From Address specifies the start
# database location to copy the number of registers set by Register Count to
# the specified To Address (destination of data).  When the data is copied,
# the order of the bytes can be altered using the Swap Code field as follows:
#
#  SWAP CODE   DEFINITION
#      0       Bytes left in original order   (1234 -> 1234)
#      1       Words are swapped              (1234 -> 3412)
#      2       Words and bytes are swapped    (1234 -> 4321)
#      3       Bytes in each word are swapped (1234 -> 2143)

[DATA MAP]
#   From        To    Register   Swap    Delay
#Address   Address       Count   Code   Preset
START
#    4000      2000           9      0     1000
#    4020      2010          10      0     1000
#    6300      2020          20      0     1001
#    6410      2040          10      0     1001
#    7900      2050          20      0     1002
#    8100      2070          20      0     1003
#    6810      3000     32      0     1000
END
```

The following table lists the parameters configured for each CLVM port:

[Section]/Item	Value	Range	Description
[CLVM PORT x]			Definition for specified CLVM port x.
Enabled:		Yes or No	This parameter is used to define if this port will be utilized. If the parameter is set to No, the port is disabled. A value of Yes will enable the port.
RS Interface:		Code 0 to 2	This parameter specifies the RS interface to be utilized when serial ports are used on the serial expansion module (Ports 1 to 3). The codes are as follows: 0=RS-232 1=RS-485 2=RS-422
Baud Rate:		Baud Rate Value	This is the baud rate to be used on the port. Enter the baud rate as a value. For example, to select 19K baud, enter 19200. Valid entries for this field include: 110, 150, 300, 600, 1200, 2400, 4800, 9600, 19200, 28800, 38400, 57600 and 115.

[Section]/Item	Value	Range	Description
Data Bits/Parity:		1 - 5	1 = 8/None, 2 = 8/Even, 3 = 7/Even, 4 = 8/Odd, 5 = 7/Odd
Stop Bits:		1 or 2	This parameter sets the number of stop bits to be used with each data value sent. Valid entries for this field are 1 and 2.
RTS On:		0 to 65535	This parameter sets the number of milliseconds to delay after RTS is asserted before the data will be transmitted. Valid values are in the range of 0 to 65535.
RTS Off:		0 to 65535	This parameter sets the number of milliseconds to delay after the last byte of data is sent before the RTS modem signal will be set low. Valid values are in the range of 0 to 65535.
Use CTS Line:		Yes or No	This parameter is used to specify the handshaking used on the port. The code values are as follows: N=No hardware, Y=RTS/CTS hardware handshaking.
Rx DB Start:		0 to 3896	This parameter specifies the starting location in the internal database where the received data will be stored. The buffer holds 130 words, however, the first two words of the data area are used to define the sequence number and the Rx message length. Refer to section 2.1.1 for detailed information on Rx data structure.
Swap Rx Data Bytes:		Yes or No	This parameter is determines if the data received by the server will have the byte order of the data swapped. If the parameter is set to No, no byte swapping will occur. If the parameter is set to Yes, the odd byte will be swapped with the even byte in each word of data received.
Rx Start Character		ASCII Characters	This character is used to define the start character at the start of each received message. The default is STX.
Rx Term Character:		ASCII Characters	This character is used to define the termination character at the end of each received message. The default is ETX.

[Section]/Item	Value	Range	Description
Download		0 to 3999	The download database location is used to trigger configuration downloads to the CLV device. 0 = disabled, 1 = download permanent, 2 = download temporary
Upload		0 to 3999	The upload database location is used to trigger configuration uploads from the CLV device. 0 = disabled, 3 = upload
Configuration Address		-1 to 3749	The configuration address database location is the starting location where the configuration data for download and upload is stored. If the parameter is set to –1, this functionality is disabled.

After setting up the configuration file, download it to the module using the Configuration/Debugger port.

5 Driver Status Data

Each CLVM port associated with the CLVM driver has an associated status data area. This data is located in the virtual address range of the module. The map data functionality of the module must be used to map this data into the normal data range of the module's database. The following table lists the content of the status data areas associated with each CLVM port driver:

Status Register	Description
Port 0 Status Data	
6300	Receive State
6301	Receive character count
6302	Receive message count
6303	Transmit State
6304	Transmit character count
6305	Transmit message count
6306	Configuration error word
6307	No Valid Data
…	
6309	
Port 1 Status Data	
6700	Receive State
6701	Receive character count
6702	Receive message count
6703	Transmit State
6704	Transmit character count
6705	Transmit message count
6706	Configuration error word
6707	No Valid Data
…	
6709	
Port 2 Status Data	
7100	Receive State
7101	Receive character count
7102	Receive message count
7103	Transmit State
7104	Transmit character count
7105	Transmit message count
7106	Configuration error word
7107	No Valid Data
…	
7109	
Port 3 Status Data	
7500	Receive State
7501	Receive character count
7502	Receive message count

7503	Transmit State
7504	Transmit character count
7505	Transmit message count
7506	Configuration error word
7507	No Valid Data
…	
7509	

If the module is configured correctly, the configuration error word should have a value of zero. Any other value indicates a configuration error. Use the value in the configuration error word to determine which set of parameters are invalid in the driver configuration area. The following table lists the bits associated with each configuration error in the word:

Bit	Code	Description
0	0x0001	Invalid selection for enabled parameter
1	0x0002	Invalid RS Interface parameter
2	0x0004	Invalid Baud rate
3	0x0008	Invalid Data Bits/Parity (1 – 5)
4	0x0010	Invalid Stop Bits (1, 2)
5	0x0020	Invalid Use CTS Line (Y, N)
6	0x0040	Reserved
7	0x0080	Invalid Rx DB Start
8	0x0100	Invalid Swap Rx Data Bits
9	0x0200	Invalid Rx Start Character
10	0x0400	Invalid Rx Term Character
11	0x0800	Invalid Download parameter
12	0x1000	Invalid Upload parameter
13	0x2000	Invalid Configuration Address
14	0x4000	Reserved
15	0x8000	Reserved

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