

## I-Dent® Marker Communications for 186 CPU Firmware Versions 1 and 2

### Introduction

This document will describe the [Extended Protocol Communications](#) as implemented with the InfoSight I-Dent ® marker software. Extended Protocol is intended to provide secure communications with an intelligent host device. This document assumes familiarity with the ASCII character code as well as fundamental computer programming skills.

### Disclaimer

Note: This document is correct to the best knowledge of InfoSight Corporation. InfoSight Corporation reserves the right to change this document or the system it describes without notice.

Communications is established via an RS232 serial connection with the following parameters:

Baud Rate	Selectable 1200 to 19200
Data Bits	7 or 8
Parity	ODD, EVEN or NONE
Start Bits	1 or 2
Stop Bits	1
Three Wire	RX, TX and GND

XON/XOFF handshaking is not implemented in this marker.

Communications with the marking controller is accomplished via a Master / Slave arrangement with the Host being the Master and the marking system the slave. The slave will only transmit in response to a message from the master.

### Standard Message TYPES

The following is a list of message types which are provided with the marking system.

**1 through 5** - The DATA TEXT contains a text string which is a message to be placed into the Message Text register in the field specified by the data type for the currently assigned message buffer. Since the string is stored in the Message Text register, a corresponding flag must be placed into the Format text to cause this data to be printed. The response message contains no data in the DATA TEXT field.

### Assign a Buffer

**A** - The DATA TEXT field contains an ASCII string which represents a number (from 1 to 10) specifying the buffer number to Assign for

printing. The response message contains no data in the DATA TEXT field.

#

# - The message buffer to assign.

### Query for Buffer Assignment

**B** - This type is used to query the marker to determine which buffer is currently assigned. The response message will contain the currently assigned buffer number in the DATA TEXT field. Use this message to obtain the currently assigned buffer before assigning a new buffer if you will wish to restore the original setting later.

### Comm Link Check

**C** - This type is used to check the communications link integrity. No data is required in the message, and no data is returned in the response. An ACK response will indicate that the link is functioning properly.

### Force Outputs

**F** - This type is used to have the marker force one of its output bits into the specified state. The DATA TEXT field must contain two integers, separated by commas, which represent the number of the output module and its desired state as follows:

#, #

Each number is a decimal integer. A comma separates the two numbers. The numbers represent the following:

#	- Module Number	(0 - 23)
#	- State	(0=Off, 1=On)

Note: When forcing an output, it may only stay in its forced state until the next scan of the control program. Unlike forcing an output in a PLC, this does not override the scanning logic.

*CAUTION:* Use of this message can cause damage to the equipment or injury to personnel.

### Begin Marking Print Cycle (Go)

**G** - This type is used to cause the marker to begin printing. The print cycle will only begin if the marker is On-line. The response message contains no data in the DATA TEXT field.

### Marker Setup Parameters

**P** - This type is used to send Parameter setup information to the marker. Parameter data is sent down in packets, where each packet uses the P message type. The first character of the DATA TEXT field must be a sub-type which identifies the packet type. Following

the packet type character is the data for the parameters. The response message contains no data in the DATA TEXT field. The message sub-types are as follows:

**D** - This sub-type is used to instruct the system to store the currently loaded parameters as the default parameters. Once this operation is performed, the current parameters will be used whenever the operator selects "Defaults" in a setup screen. There is no data in the DATA TEXT field of the message or the response.

**G** - This sub-type is used to download the parameters which describe the system message format. The DATA TEXT field must contain a list of eight integer values separated by commas:

#, #, #, #, #, #, #, #

The data represents the following information:

#	- Character Spacing	(1, 2 or 3)
#	- Number of Lines	(1 - 5)
#	- Characters per Line	(1 - 158)
#	- Inverse Print	(0=Off, 1=On)
#	- Slash in Zero	(0=No Slash, 1=Slash)
#	- Justification	(0=Bottom, 1=Center, 2=Top)
#	- Font	(0=5x7, 1=7x9, 2=7x11, 3=11x16)
#	- Flags	(reserved, send 0)

**H** - This sub-type is used to download the protocol and related parameters for host communications. The DATA TEXT field must contain a list of eight integer values separated by commas:

#, #, #, #, #, #, #, #

The data represents the following information:

#	- Protocol	(0=Extended, 1=Programmable)
#	- Station ID	(0=None)
#	- Start Character	(0=None)
#	- Offset	(0 -> ...)
#	- Length	(# of chars to accumulate)
#	- Terminator	(Required)
#	- Character to Ignore	(Optional, 0 if not used)
#	- Flags	(reserved, send 0)

Note that the Station ID field applies only to Extended Protocol, while the other fields apply only to Programmable Protocol. Non-applicable fields must still be supplied (send 0) in this message.

**M** - This sub-type indicates that the DATA TEXT field contains the marker configuration parameters. These parameters, separated by commas, must have the following format:

##,##,##,##,##,##,##,##,##,##,##,##,##,##,##,##

Each number represented by #.# are floating point values with the decimal point optional. Each number represented by a single # is an integer value. The numbers represent in order the following values:

#	- Driver On-Time	(mS)
#	- Pulse Delay	(mS)
#	- Number of Heads	(1 - 5)
#	- Number of Jets/Head	(7,9,11 or 16)
#	- Encoder Divider	(1 -> ...)
#	- Pixel Count	(1 - 40)
#	- Negative Angle	(0=Off, 1=On)
#	- Repeat Method	(0=None, 1=I/O, 2=Count)
#	- Direction	(0=Right, 1=Left)
#	- Bidirectional	(0=Off, 1=On)
#	- Limit Spacing	(0 -> ...)
#	- Flags	(reserved, send 0)
#.#	- Character Height	
#.#	- Character Width	
#.#	- Encoder Resolution	
#.#	- Jet Spacing	

**O** - This sub-type indicates that the DATA TEXT field contains the communications parameters. These parameters, separated by commas, must have the following format:

##,##,##,##

Each number is a single digit in length. The numbers represent the following fields:

#	- Comm Port number (2, 3 or 4)
#	- Baud Rate (0=19200, 1=9600, 2=4800, 3=2400, 4=1200)
#	- Data Bits (0=7, 1=8)
#	- Stop Bits (0=1, 1=2)
#	- Parity(0=Even, 1=Odd, 2=None)

**P** - This sub-type indicates that the characters in the DATA TEXT field are new password strings. Up to 4 strings, separated by commas, can be included in the message. The first string is the Supervisor password and is the only string currently defined.

**S** - This sub-type indicates that the DATA TEXT field contains the user table parameters. These parameters, separated by commas, must have the following format:

SSS,SSS,SSS,SSS,SSS,SSS,#		
SSS	- User Month Table	(12 characters)
SSS	- User Year Table	(10 characters)
SSS	- User Shift Table	(3 characters)
SSS	- Start time of shift 1	(HH:MM)
SSS	- Start time of shift 2	(HH:MM)
SSS	- Start time of shift 3	(HH:MM)
#	- Flags	(reserved, send 0)

**U** - This sub-type indicates that the Units of measure follow in the message. The character in the DATA TEXT field determines the new setting of the units.

0	(ASCII zero)	- English Units
1	(ASCII one)	- Metric Units

### Query for Record Information Upload

**Q** - This type is used to request Record information for the currently assigned data buffer. Record data is requested in packets, where each packet uses the Q message type. The first character of the DATA TEXT field must be a sub-type which identifies the packet type. Following the packet type character for some sup-types is the slot number for the request. The response message contains the requested data in the DATA TEXT field. The message sub-types are as follows:

**F** - This sub-type is used to request the Format attributes for the currently assigned message buffer. The response message DATA TEXT field contains the format strings for each of the five messages.

SSS,SSS,SSS,SSS,SSS		
SSS	- The format string for message 1	
SSS	- The format string for message 2	
SSS	- The format string for message 3	
SSS	- The format string for message 4	
SSS	- The format string for message 5	

**G** - This sub-type is used to request the record flags. The response message contains the flags, each one separated by a comma. Currently only one flag is defined:

#		
#	- Message Flags	(reserved)

**I** - This sub-type is used to request the data for the product information fields for the currently assigned buffer. The response message



# - The increment value (can be signed)

**T** - This sub-type is used to request the data for a specific fault text field. The DATA TEXT field must contain the desired slot number within the buffer. The slot number must be from 0 to 15, corresponding to slot 1 to 16. The response message will contain the fault data for the indicated slot:

SSS,#

SSS - The fault text for this slot (up to 40 characters)  
# - The display attributes for this fault.(Bit 1 (lsb) = Flash,  
Bit 2 = Bold)

**U** - This sub-type is used to request the data for the product information setup. The response message will contain the product information setups:

SSS,SSS,#,SSS,SSS,#,SSS,SSS,#,SSS,SSS,#,SSS,SSS,#,SSS,SSS,#,

SSS - The display prompt string. (up to 10 characters)  
SSS - The verify string. (up to 20 characters)  
# - The flags. (Bit 1 (lsb) = Active,  
Bit 2 = Auto Clear)

Note that these three values are repeated for each of the six product info setup fields.

**X** - This sub-type is used to request the suffix strings for the currently assigned message buffer. There is one suffix string for each of the five messages in the buffer. The response message will contain five strings separated by commas:

SSS,SSS,SSS,SSS,SSS

SSS - The suffix string for messages 1 through 5

**Download Record Information**

**R** - This type is used to send Record information for the currently assigned data buffer. This type allows the transmission of more than just printable text strings.

Record data is sent down in packets, where each packet uses the R message type. The first character of the DATA TEXT field must be a sub-type which identifies the packet type. Following the packet type character is the data for the record. The response message contains no data in the DATA TEXT file. The message sub-types are as follows:

**F** - This sub-type is used to send the format strings for the currently assigned message buffer.

SSS,SSS,SSS,SSS,SSS





#,#,#,#

#	- The serial number
#	- The lower limit value
#	- The upper limit value
#	- The increment value

**T** - This sub-type is used to send the data for a specific fault field. The first item in the DATA TEXT field must be the slot number within the fault table (the fault code). The slot number must be from 0 to 15, corresponding to slot 1 to 16. Following the slot number are the rest of the data fields for the slot.

#,SSS,#

#	- The slot number (0 to 15)
SSS	- The text for this fault field (up to 40 characters)
#	- The flags for this fault field. (Bit 1 (lsb) = Flash, Bit 2 = Bold)

**U** - This sub-type is used to send the Production Information Setup values for the currently assigned message buffer.

SSS,SSS,#,SSS,SSS,#,SSS,SSS,#,SSS,SSS,#,SSS,SSS,#,SSS,SSS,#

SSS	- The product info setup prompt (up to 10 characters)
SSS	- The product info setup verify text (up to 20 characters)
#	- The product info flags (Bit 1 (lsb) = Active, Bit 2 = Auto Clear)

Note that these three values are repeated for each of the six product info setup fields.

**X** - This sub-type is used to send the suffix text strings for each message line of the currently assigned buffer.

SSS,SSS,SSS,SSS,SSS

SSS	- The suffix text strings for message lines 1-5
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**Query for Status**

**S** - This type is used to query the marker for its current status. There is no DATA TEXT field for this type. The ACK response message from the marker will contain a DATA TEXT field. This field will contain three numbers separated by commas. These numbers represent the states of the three I/O ports of the marker. The numbers must be converted into binary, where each bit will represent the state of an input or output point.

##,

- # - The value of the current state of the Output port
- # - The value of the current state of Input port 1
- # - The value of the current state of Input port 2

Field 1 - Output Port

Bit	0 (lsb)	-	READY
	1	-	PRINTING
	2	-	DONE
	3	-	CALIBRATE REQUEST
	4	-	
	5	-	
	6	-	
	7	-	

Field 2 - Input Port

Bit	0 (lsb)	-	AUTO ENABLED
	1	-	START PRINT
	2	-	ABORT PRINT
	3	-	PULSE
	4	-	DIRECTION
	5	-	SOLVENT
	6	-	PRE-COMPILE
	7	-	CALIBRATING

Field 3 - Input Port

Bit	0 (lsb)	-	I/O REPEAT BEGIN
	1	-	I/O REPEAT ENABLE
	2	-	spare
	3	-	spare
	4	-	FAULT 1
	5	-	FAULT 2
	6	-	FAULT 4
	7	-	FAULT 8

## Set Time and Date

**T** - This type is used to set the time and date of the marker's built-in clock/calendar. The DATA TEXT field for this message must contain the time and date separated by commas in the following format:

HH:MM,MM/DD/YY

HH:MM - The current time of day in military 24 hour format  
MM/DD/YY - The current date.

There is no data in the DATA TEXT field of the response message.

## Upload Marker Setup Parameters

**U** - This type is used to upload Parameter setup information from the marker. Parameter data is uploaded in packets, where each packet uses the U message type. The first character of the DATA TEXT field must be a sub-type which identifies the packet type. The response message contains the requested data in the DATA TEXT field. The message sub-types are as follows:

**G** - This sub-type is used to upload the parameters which describe the system message format. The DATA TEXT field of the response message will contain a list of eight integer values separated by commas:

#, #, #, #, #, #, #, #

The data represents the following information:

#	- Character Spacing	(1, 2 or 3)
#	- Number of Lines	(1 - 5)
#	- Characters per Line	(1 - 158)
#	- Inverse Print	(0=Off, 1=On)
#	- Slash in Zero	(0=No Slash, 1=Slash)
#	- Justification	(0=Bottom, 1=Center, 2=Top)
#	- Font	(0=5x7, 1=7x9, 2=7x11, 3=11x16)
#	- Flags	(reserved)

**H** - This sub-type is used to upload the protocol and related parameters for host communications. The DATA TEXT field of the response message will contain a list of eight integer values separated by commas:

#, #, #, #, #, #, #, #

The data represents the following information:

#	- Protocol	(0=Extended, 1=Programmable)
#	- Station ID	(0=None)
#	- Start Character	(0=None)



**P** - This sub-type is used to upload the password strings. The DATA TEXT field of the response message will contain the password strings. Four strings, separated by commas, are included in the message. The first string is the Supervisor password and is the only string currently defined.

**S** - This sub-type is used to upload the user table parameters. The DATA TEXT field of the response message will contain the user table parameters. These parameters, separated by commas, have the following format:

SSS,SSS,SSS,SSS,SSS,SSS,#

SSS	- User Month Table	(12 characters)
SSS	- User Year Table	(10 characters)
SSS	- User Shift Table	(3 characters)
SSS	- Start time of shift 1	(HH:MM)
SSS	- Start time of shift 2	(HH:MM)
SSS	- Start time of shift 3	(HH:MM)
#	- Flags	(reserved)

**U** - This sub-type is used to query for the units of measure. The character in the DATA TEXT field of the response message determines the units.

0	(ASCII zero)	- English Units
1	(ASCII one)	- Metric Units

## Conclusion

This concludes the description of the Extended Protocol for communications with the InfoSight Corporation I-Dent® Marking System Software. Please refer all questions to the factory.

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