Application Services (866) 284-5509

Technical Bulletin AS 060205 JM

Fieldbus Setup on the Insight ICG

Description:
This bulletin describes the correct setup and programming procedures for the Fieldbus Interface on the Insight ICG controller.

Table of Contents:

Example I/O Maps:

The size of the message packet is 32 bytes. Out of 32 bytes, the first 5 bytes are used for the packet header information. The remaining 27 bytes are for the data. An ACK message must be received before the next packet can be sent. The definition of the data messages is given as follows:

1) Packet Header (Originator: Fieldbus slave or master , Size: 5 bytes)

This header will precede all messages sent and received.

Byte 0: Incremental Message Number
This is an arbitrary number used to identify this as a unique message and must be different from the previous message.

Byte 1: Message Type
This number is used to identify this message as a particular message (Pre Cycle = 0, During Cycle = 1, or Post Cycle = 2).

Byte 2: Packet Number
This is the incremental packet # of the message.

Byte 3: Number of Packets
This number is used to identify the total number of packets being sent for this message.

Byte 4: Data Size
This number is used to identify the number of bytes of actual data being sent in this packet. This number can be from 1 to 27.

2) Packet Acknowledge (Originator: Fieldbus slave or master , Size: 5 bytes)

This message will be sent when a packet is received.

Byte 0: Incremental Message Number
This number must be taken from byte #1 of the header from the received message.

Byte 1: Message Type
This number is used it identify this message as an ACK Message. This number is a constant equal to 3.

Byte 2: Packet Number
This number must be taken from byte #3 of the header from the received message.

Byte 3: Number of Packets
This number must be taken from byte #4 of the header from the received message.

Byte 4: Received Message Type
This number must be taken from byte #2 of the header from the received message.

3) Pre-Cycle Packet Data: (Originator: Fieldbus master, Size: 1 to 2 packets)

This data will be the serial # or barcode scanned for a part. This is an optional data that the bus master can send to Insight-IC. The maximum size of the barcode is 40 characters. If the barcode is more than 26 characters, two packets will be needed to send the data. For barcodes less then 27 characters, only one packet is required.

Byte 5: Powerhead #
This is a number between 1-6 designating the powerhead #.

Byte 6 to up to byte #45: Serial#/barcode/etc.
This will typically be either a barcode or a serial #.

Example: Fieldbus master sends a barcode

12345678901234567890123456789O to powerhead #2

The message sequence would look like in hexadecimal:

```
          HEADER              DATA

MASTER: 67 00 01 02 1B      02 31 32 33 34 35 36 37 38
                            39 30 31 32 33 34 35 36 37
                            38 39 30 31 32 33 34 35 36
SLAVE:  67 03 01 02 00
MASTER: 67 00 02 02 04      37 38 39 30
SLAVE:  67 03 02 02 00
```

4) During-Cycle Packet Data: (Originator: Fieldbus master, Size: 5 bytes)

Primarily, this data message is intended for starting/stopping a cycle. Cycle may start only when the Free-Speed bit OR Soft-Speed bit is high AND Forward bit OR Reverse bit is high. Cycle will stop when the cycle completes normally or whenever the Free-Speed and Soft-Speed bits go low in a subsequent message from the bus master. All the other discrete inputs should also be extracted from this message whenever a new message is received and used in place of the I/O connector inputs.

IMPORTANT NOTE:

For Machine Mount applications, the Config MUST BE sent first, then a second transmission with the Forward and Free Speed is sent.

Byte 5: Powerhead #
This is a number between 1-6 designating the powerhead.

Byte 6 : MCE Discrete Inputs:
Bit 0 : Config #1
Bit 1 : Config #2
Bit 2 : Spindle/Powerhead Disable
Bit 3 : Spindle/Powerhead Re-enable
Bit 4 : Free Speed
Bit 5 : Soft Speed
Bit 6 : Forward
Bit 7 : Reverse

Byte 7 : Remote I/O Discrete Inputs Byte 1:
Bit 0 : Powerhead Gang Count Reset
Bit 1 : Config Reset
Bit 2 : Config #3

Bit 3 : Config #4
Bit 4 : Config #5
Bit 5 : Config #6
Bit 6 : Config #7
Bit 7 : Config #8

Byte 8 : Remote I/O Discrete Inputs Byte 2:
Bit 0 : **Reserved for future**
Bit 1 : Safety Latch
Bit 2 : Limit Switch In
Bit 3 : Limit Switch Out
Bit 4 : **Reserved for future**
Bit 5 : **Reserved for future**
Bit 6 : **Reserved for future**
Bit 7 : **Reserved for future**

Byte 9 : Remote I/O Spindle/MCE Bypass:
Bit 0 : Bypass MCE #1 in powerhead
Bit 1 : Bypass MCE #2 in powerhead
Bit 2 : Bypass MCE #3 in powerhead
Bit 3 : Bypass MCE #4 in powerhead
Bit 4 : Bypass MCE #5 in powerhead
Bit 5 : Bypass MCE #6 in powerhead
Bit 6 : **Reserved for future**
Bit 7 : **Reserved for future**

Example: Fieldbus master sends a free speed command to powerhead #1 to run config #3 in forward direction.

The message sequence would look like in hexadecimal:

```
           HEADER              DATA

MASTER: 1A 01 01 01 05     01 00 04 00 00
SLAVE:  1A 03 01 01 01

MASTER: 1B 01 01 01 05     01 50 04 00 00
SLAVE:  1B 03 01 01 01
```

5) Post-Cycle Packet Data: (Originator: Fieldbus slave, Size: 1 or more packets) bytes)

This message will be sent after an end of powerhead cycle. For all MCEs operating as individual, this will merely be sent after the end of MCE cycle.

EOR Header Data

Header data is 4 bytes long.

Byte 5: Powerhead #
This is a number between 1-6 designating the powerhead #.

Byte 6: # of MCEs in powerhead:
This is a 1-digit number that determines the # of MCEs for the powerhead in byte 1 above.

Byte 7: Settings:
Bit 0 : EOR Data
Bit 1 : Barcode enable/disable in EOR

Bit 2 : **Reserved for future**
Bit 3 : **Reserved for future**
Bit 4 : **Reserved for future**
Bit 5 : **Reserved for future**
Bit 6 : **Reserved for future**
Bit 7 : **Reserved for future**

When Bit-0 is set to "1", this will indicate to the bus-master that status and EOR data is included with this message. If it is "0", only status data is included. When Bit-1 is set to "1" Barcode is attached to EOR, otherwise barcode is not attached to the EOR.

Byte 8: Powerhead Status:
Bit 0 : Powerhead Accept
Bit 1 : Powerhead Reject
Bit 2 : **Reserved for future**
Bit 3 : **Reserved for future**
Bit 4 : **Reserved for future**
Bit 5 : **Reserved for future**
Bit 6 : **Reserved for future**
Bit 7 : Gang Complete

MCE Basic Data

MCE data is 3 or 67 bytes long depending upon if EOR is disabled or enabled. MCE data is on a per MCE basis. The maximum size of a single-frame mail message is 256 bytes. So the total # of bytes for MCE data will be 3 or 67 times the # of MCE in powerhead.

Byte 9: MCE Number:
This is the MCE ID number as designated via the CAN network connected to the MCE.

Byte 10: MCE tightening status:
Bit 0 : **Reserved for future**
Bit 1 : Accept
Bit 2 : Reject
Bit 3 : Torque High
Bit 4 : Torque Low
Bit 5 : Angle High
Bit 6 : Angle Low
Bit 7 : **Reserved for future**

Byte 11: MCE remote discrete output status:
Bit 0 : **Reserved for future**
Bit 1 : Redundancy Fault
Bit 2 : Spindle in Bypass
Bit 3 : **Reserved for future**
Bit 4 : **Reserved for future**
Bit 5 : **Reserved for future**
Bit 6 : **Reserved for future**
Bit 7 : Stats Alarm

EOR Data (sent if "EOR Data" is Enabled)

Byte 12-13: Config #:
An ASCII 2-digits for the configuration # with leading zeros.

Byte 14: Torque units:
A number corresponding to one of the 5 torque units as follows:

0 = N-M
1 = Ft-Lb
2 = In-Lb
3 = Kg-m
4 = Kg-cm

Byte 15-19: Torque value:
An ASCII 4-digits plus a decimal point with the final torque value.

Byte 20-24: Angle value:
An ASCII 5-digits final angle value.

Byte 25-27: Discrete Inputs:
Not Implemented

Byte 28-30: Discrete Outputs:
Not Implemented

Byte 31-35: Current:
An ASCII 5-digits peak current value.

Byte 36-40: Low Torque Limit value:
An ASCII 5-digits programmed low torque limit value.

Byte 41-45: High Torque Limit value:
An ASCII 5-digits programmed high torque limit value.

Byte 46-50: Low Angle Limit value:
An ASCII 5-digits programmed low angle limit value.

Byte 51-55: High Angle Limit value:
An ASCII 5-digits programmed high torque limit value.

Byte 54-60: TR value:
An ASCII 5-digits programmed transducer range value.

Byte 61-65: Torque Threshold value:
An ASCII 5-digits programmed torque threshold value.

Byte 66-70: Free Speed value:
An ASCII 5-digits programmed tool free speed value.

Byte 71-75: Shift-down Speed value:
An ASCII 5-digits programmed shift-down speed value.

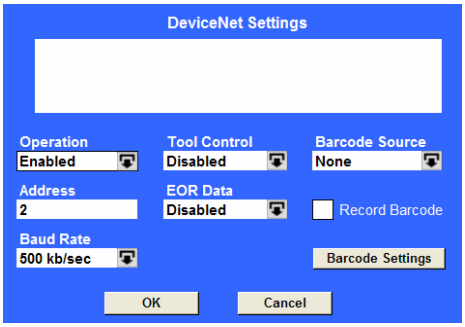
Note: The EOR data is only sent when the EOR is enabled in the fieldbus settings screen.

EOR Barcode Data

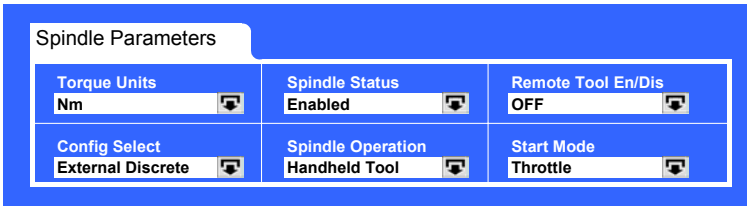
Byte 76-115: Barcode / Serial Number Data:
An ASCII 40 character barcode or serial number string.
Note: The barcode data will appear after the end-of-run data from all the MCEs in the same powerhead has been received from Insight-IC. Barcode data is only sent when the check box on the bus setting screen for recording barcode data is checked.

Accessing Screens

The **Fieldbus Settings** screen is accessed from the **Setup/ System Initialization** screen by selecting "**DeviceNet**" or "**Profibus**" from the list under **Data Port** and choosing the "**Bus Setup**" button.



The Spindle Parameters are located at the bottom of the Setup/ Spindle Initialization screen.

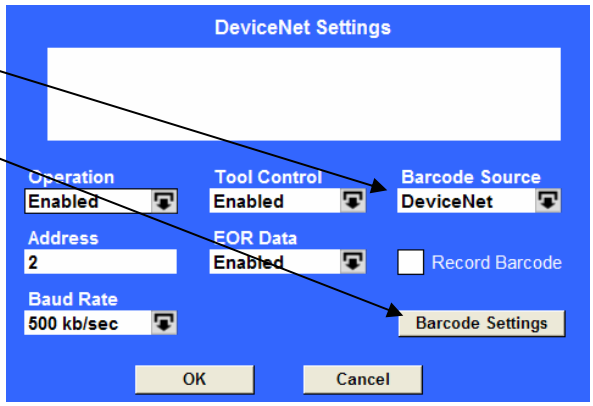


Sending a Barcode over Fieldbus

Insight IC Setup

1. Set **Barcode Source** as “DeviceNet or “Profibus”.

2. Set the length of the barcode string in the **Barcode Settings**.



PLC or PC Setup

Sending a Barcode to the Insight IC before the Cycle

STEP 1

PLC/ PC OUTPUTS
Before the cycle starts, the PC or PLC sends:

Byte 00	Message Number	1
Byte 01	Message Type	0
Byte 02	Packet Number	1
Byte 03	Number of Packets	2
Byte 04	Data Size	27

PLC/ PC INPUTS
The Insight IC will respond with:

Byte 00	Message Number	1
Byte 01	Message Type	3
Byte 02	Packet Number	1
Byte 03	Number of Packets	2
Byte 04	Received Message Type	0

Byte 05	Powerhead or Spindle #	1 or 2
Byte 06	1st digit of Barcode in ASCII	
Byte 07	2nd digit of Barcode in ASCII	
Byte 08	3rd digit of Barcode in ASCII	
Byte 09	4th digit of Barcode in ASCII	
Byte 10	5th digit of Barcode in ASCII	
Byte 11	6th digit of Barcode in ASCII	
Byte 12	7th digit of Barcode in ASCII	
Byte 13	8th digit of Barcode in ASCII	
Byte 14	9th digit of Barcode in ASCII	
Byte 15	10th digit of Barcode in ASCII	
Byte 16	11th digit of Barcode in ASCII	
Byte 17	12th digit of Barcode in ASCII	
Byte 18	13th digit of Barcode in ASCII	
Byte 19	14th digit of Barcode in ASCII	
Byte 20	15th digit of Barcode in ASCII	
Byte 21	16th digit of Barcode in ASCII	
Byte 22	17th digit of Barcode in ASCII	
Byte 23	18th digit of Barcode in ASCII	
Byte 24	19th digit of Barcode in ASCII	
Byte 25	20th digit of Barcode in ASCII	
Byte 26	21st digit of Barcode in ASCII	
Byte 27	22nd digit of Barcode in ASCII	
Byte 28	23rd digit of Barcode in ASCII	
Byte 29	24th digit of Barcode in ASCII	
Byte 30	25th digit of Barcode in ASCII	
Byte 31	26th digit of Barcode in ASCII	

Note: You might not need to send all 40 characters. Only send as many as needed.
If there are 26 characters or less, you only need to do STEP 1.
Make sure that the number of charachters sent matches the number in the "Barcode Setup" in the Fieldbus Initialization screen.

Sending a Barcode over Fieldbus (continued)

STEP 2

PLC/ PC OUTPUTS
Then the PC or PLC sends:

Byte 00	Message Number + 1	2
Byte 01	Message Type	0
Byte 02	Packet Number	2
Byte 03	Number of Packets	2
Byte 04	Data Size	14

PLC/ PC INPUTS
The Insight IC will respond with:

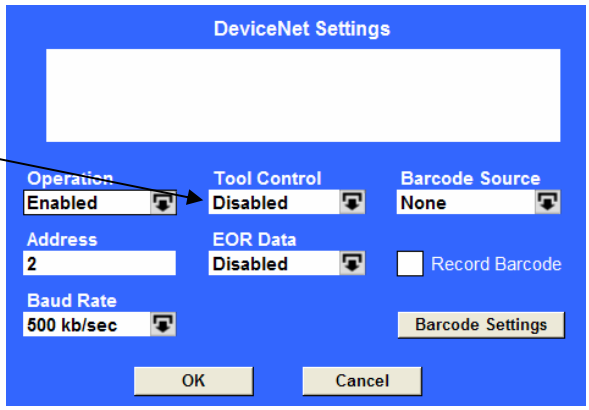
Byte 00	Message Number + 1	2
Byte 01	Message Type	3
Byte 02	Packet Number	2
Byte 03	Number of Packets	2
Byte 04	Received Message Type	0

Byte 05	27th digit of Barcode in ASCII
Byte 06	28th digit of Barcode in ASCII
Byte 07	29th digit of Barcode in ASCII
Byte 08	30th digit of Barcode in ASCII
Byte 09	31st digit of Barcode in ASCII
Byte 10	32nd digit of Barcode in ASCII
Byte 11	33rd digit of Barcode in ASCII
Byte 12	34th digit of Barcode in ASCII
Byte 13	35th digit of Barcode in ASCII
Byte 14	36th digit of Barcode in ASCII
Byte 15	37th digit of Barcode in ASCII
Byte 16	38th digit of Barcode in ASCII
Byte 17	39th digit of Barcode in ASCII
Byte 18	40th digit of Barcode in ASCII

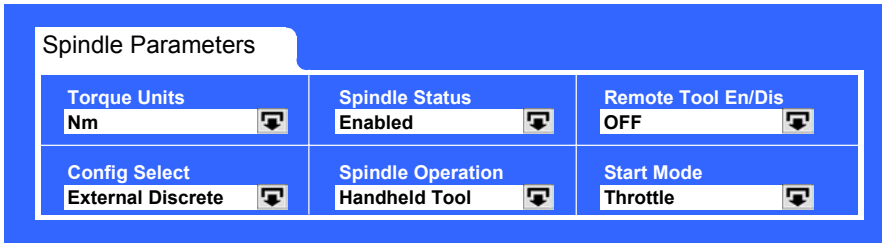
Handheld Tool with Internal or I/O Configuration Selection

Insight IC Setup

1. Set **Tool Control** to ”Disabled”.



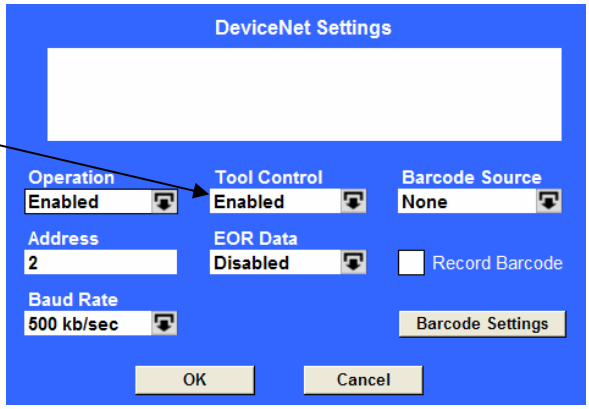
2. Set up the tool as a “**Handheld**” and set the **Config Select** in the **Setup/ Spindle Initialization** screen.



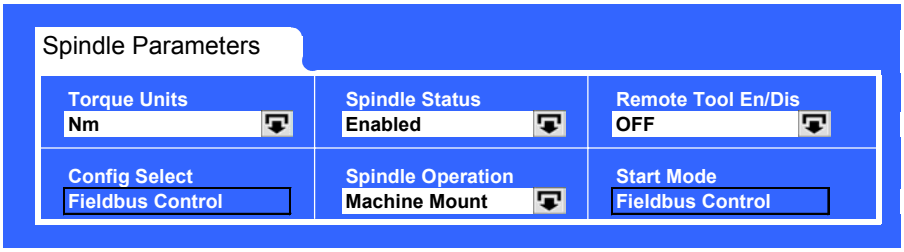
Handheld Tool with Fieldbus Configuration Selection

Insight IC Setup

1. Set **Tool Control** to ”Enabled”.



2. Set up the tool as a “**Handheld**” in the **Setup/ Spindle Initialization** screen.



Handheld Tool with Fieldbus Configuration Selection (continued)

PLC or PC Setup

Sending Configuration over Fieldbus for a Handheld Tool

STEP 1

PLC/ PC OUTPUTS
Before the cycle starts, the PC or PLC sends:

Byte 00	Message Number	1
Byte 01	Message Type	1
Byte 02	Packet Number	1
Byte 03	Number of Packets	1
Byte 04	Data Size	5

PLC/ PC INPUTS
The Insight IC will respond with:

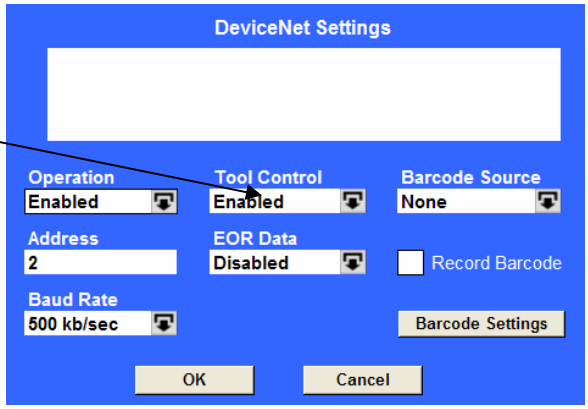
Byte 00	Message Number	1
Byte 01	Message Type	3
Byte 02	Packet Number	1
Byte 03	Number of Packets	1
Byte 04	Received Message Type	1

Byte 05		Spindle #	1 or 2
Byte 06	Bit 048	Config #1	0 or 1
	Bit 049	Config #2	0 or 1
	Bit 050	Spindle Disable	0
	Bit 051	Spindle Re-Enable	0
	Bit 052	Free Speed	0
	Bit 053	Soft Speed	0
	Bit 054	Forward	0
	Bit 055	Reverse	0
Byte 07	Bit 056	PH Gang Count Reset	0
	Bit 057	Config Reset	0
	Bit 058	Config #3	0 or 1
	Bit 059	Config #4	0 or 1
	Bit 060	Config #5	0 or 1
	Bit 061	Config #6	0 or 1
	Bit 062	Config #7	0 or 1
	Bit 063	Config #8	0 or 1
Byte 08	Bit 064	Not Used	0
	Bit 065	Safety Latch	0
	Bit 066	Limit Switch In	0
	Bit 067	Limit Switch Out	0
	Bit 068	Not Used	0
	Bit 069	Not Used	0
	Bit 070	Not Used	0
	Bit 071	Not Used	0
Byte 09	Bit 072	Bypass Spindle #1	0
	Bit 073	Bypass Spindle #2	0
	Bit 074	Bypass Spindle #3	0
	Bit 075	Bypass Spindle #4	0
	Bit 076	Bypass Spindle #5	0
	Bit 077	Bypass Spindle #6	0
	Bit 078	Not Used	0
	Bit 079	Not Used	0

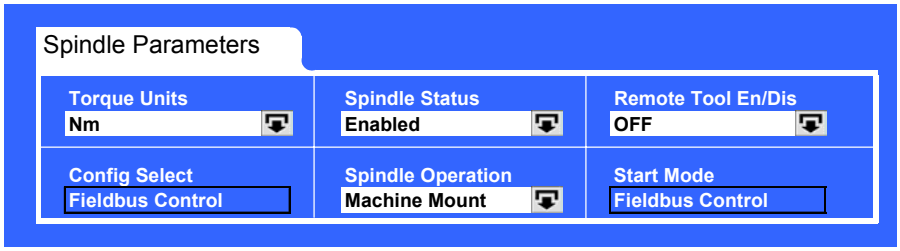
Machine Mount Tool

Insight IC Setup

1. Set **Tool Control** to ”Enabled”.



2. Set up the tool as a “**Machine Mount**” in the **Setup/ Spindle Initialization** screen.



Machine Mount Tool (continued)

PLC or PC Setup

Starting a Machine Mount Cycle

STEP 1 - Select Configuration

PLC/ PC OUTPUTS
Before the cycle starts, the PC or PLC sends:

Byte 00	Message Number	1
Byte 01	Message Type	1
Byte 02	Packet Number	1
Byte 03	Number of Packets	1
Byte 04	Data Size	5

PLC/ PC INPUTS
The Insight IC will respond with:

Byte 00	Message Number	1
Byte 01	Message Type	3
Byte 02	Packet Number	1
Byte 03	Number of Packets	1
Byte 04	Received Message Type	1

Byte 05		Spindle or Powerhead #	1 or 2
Byte 06	Bit 048	Config #1	0 or 1
	Bit 049	Config #2	0 or 1
	Bit 050	Spindle Disable	0
	Bit 051	Spindle Re-Enable	0
	Bit 052	Free Speed	0
	Bit 053	Soft Speed	0
	Bit 054	Forward	0
	Bit 055	Reverse	0
Byte 07	Bit 056	PH Gang Count Reset	0
	Bit 057	Config Reset	0
	Bit 058	Config #3	0 or 1
	Bit 059	Config #4	0 or 1
	Bit 060	Config #5	0 or 1
	Bit 061	Config #6	0 or 1
	Bit 062	Config #7	0 or 1
	Bit 063	Config #8	0 or 1
Byte 08	Bit 064	Not Used	0
	Bit 065	Safety Latch	0
	Bit 066	Limit Switch In	0
	Bit 067	Limit Switch Out	0
	Bit 068	Not Used	0
	Bit 069	Not Used	0
	Bit 070	Not Used	0
	Bit 071	Not Used	0
Byte 09	Bit 072	Bypass Spindle #1	0
	Bit 073	Bypass Spindle #2	0
	Bit 074	Bypass Spindle #3	0
	Bit 075	Bypass Spindle #4	0
	Bit 076	Bypass Spindle #5	0
	Bit 077	Bypass Spindle #6	0
	Bit 078	Not Used	0
	Bit 079	Not Used	0

Machine Mount Tool (continued)

STEP 2 - Start Tool

PLC/ PC OUTPUTS
Then the PC or PLC sends:

Byte 00	Message Number + 1	2
Byte 01	Message Type	1
Byte 02	Packet Number	1
Byte 03	Number of Packets	1
Byte 04	Data Size	5

PLC/ PC INPUTS
The Insight IC will respond with:

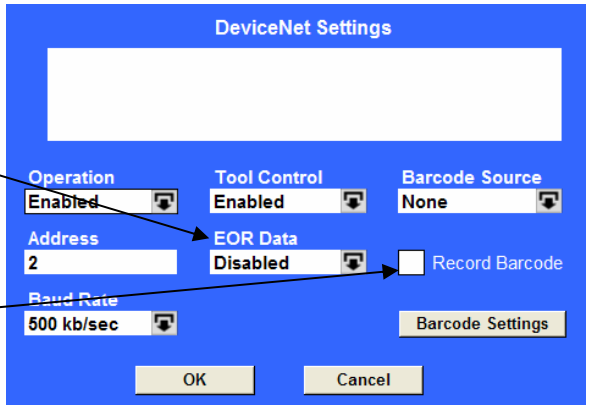
Byte 00	Message Number + 1	2
Byte 01	Message Type	3
Byte 02	Packet Number	1
Byte 03	Number of Packets	1
Byte 04	Received Message Type	1

Byte 05		Powerhead or Spindle #	1 or 2
Byte 06	Bit 048	Config #1	0 or 1
	Bit 049	Config #2	0 or 1
	Bit 050	Spindle Disable	0
	Bit 051	Spindle Re-Enable	0
	Bit 052	Free Speed	1
	Bit 053	Soft Speed	0
	Bit 054	Forward	1
	Bit 055	Reverse	0
Byte 07	Bit 056	PH Gang Count Reset	0
	Bit 057	Config Reset	0
	Bit 058	Config #3	0 or 1
	Bit 059	Config #4	0 or 1
	Bit 060	Config #5	0 or 1
	Bit 061	Config #6	0 or 1
	Bit 062	Config #7	0 or 1
	Bit 063	Config #8	0 or 1
Byte 08	Bit 064	Not Used	0
	Bit 065	Safety Latch	0
	Bit 066	Limit Switch In	0
	Bit 067	Limit Switch Out	0
	Bit 068	Not Used	0
	Bit 069	Not Used	0
	Bit 070	Not Used	0
	Bit 071	Not Used	0
Byte 09	Bit 072	Bypass Spindle #1	0
	Bit 073	Bypass Spindle #2	0
	Bit 074	Bypass Spindle #3	0
	Bit 075	Bypass Spindle #4	0
	Bit 076	Bypass Spindle #5	0
	Bit 077	Bypass Spindle #6	0
	Bit 078	Not Used	0
	Bit 079	Not Used	0

Basic Cycle Result

Insight IC Setup

1. Set **EOR Data** to ”Disabled”.
2. Uncheck “**Record Barcode**”



Basic Cycle Result

STEP 1

PLC/ PC INPUTS

At the end of Cycle, Insight sends:

Byte 00	Message Number	X
Byte 01	Message Type	2
Byte 02	Packet Number	1
Byte 03	Number of Packets	1
Byte 04	Data Size	7

PLC/ PC OUTPUTS

PC or PLC must respond with:

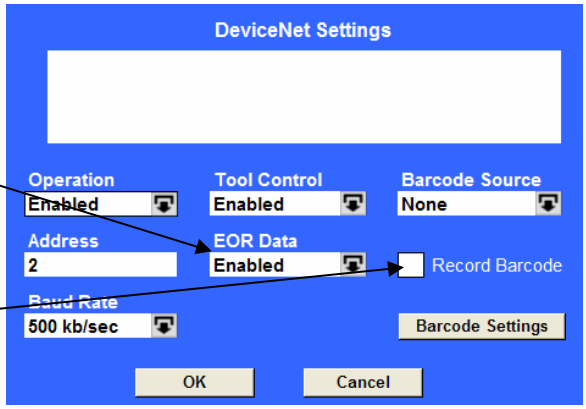
Byte 00	Message Number	X
Byte 01	Message Type	3
Byte 02	Packet Number	1
Byte 03	Number of Packets	1
Byte 04	Received Message Type	2

Byte 05		Powerhead or Spindle #	1
Byte 06		# of Spindles in Powerhead	1 or 2
Byte 07	Bit 056	EOR Enable	0
	Bit 057	Barcode Enable	0
	Bit 058	Not Used	0
	Bit 059	Not Used	0
	Bit 060	Not Used	0
	Bit 061	Not Used	0
	Bit 062	Not Used	0
	Bit 063	Not Used	0
Byte 08	Bit 064	Powerhead Accept	0 or 1
	Bit 065	Powerhead Reject	0 or 1
	Bit 066	Not Used	0
	Bit 067	Not Used	0
	Bit 068	Not Used	0
	Bit 069	Not Used	0
	Bit 070	Not Used	0
	Bit 071	Powerhead Gang Complete	0 or 1
Byte 09		Spindle #	1 or 2
Byte 10	Bit 080	Not Used	0 or 1
	Bit 081	Accept	0 or 1
	Bit 082	Reject	0 or 1
	Bit 083	Torque High	0 or 1
	Bit 084	Torque Low	0 or 1
	Bit 085	Angle High	0 or 1
	Bit 086	Angle Low	0 or 1
	Bit 087	Not Used	0 or 1
Byte 11	Bit 088	Not Used	0
	Bit 089	Redundancy Fault	0 or 1
	Bit 090	Spindle in Bypass	0 or 1
	Bit 091	Not Used	0
	Bit 092	Not Used	0
	Bit 093	Not Used	0
	Bit 094	Not Used	0
	Bit 095	Stats Alarm	0 or 1

Cycle Result with EOR Information

Insight IC Setup

1. Set **EOR Data** to ”Enabled”.
2. Uncheck “**Record Barcode**”



Cycle Result with EOR Enabled

STEP 1

PLC/ PC INPUTS
At the end of Cycle, Insight sends:

Byte 00	Message Number	X
Byte 01	Message Type	2
Byte 02	Packet Number	1
Byte 03	Number of Packets	3
Byte 04	Data Size	27

PLC/ PC OUTPUTS
PC or PLC must respond with:

Byte 00	Message Number	X
Byte 01	Message Type	3
Byte 02	Packet Number	1
Byte 03	Number of Packets	3
Byte 04	Received Message Type	2

Byte 05		Powerhead or Spindle #	1
Byte 06		# of Spindles in Powerhead	1 or 2
Byte 07	Bit 056	EOR Enable	1
	Bit 057	Barcode Enable	0
	Bit 058	Not Used	0
	Bit 059	Not Used	0
	Bit 060	Not Used	0
	Bit 061	Not Used	0
	Bit 062	Not Used	0
	Bit 063	Not Used	0
Byte 08	Bit 064	Powerhead Accept	0 or 1
	Bit 065	Powerhead Reject	0 or 1
	Bit 066	Not Used	0
	Bit 067	Not Used	0
	Bit 068	Not Used	0
	Bit 069	Not Used	0
	Bit 070	Not Used	0
	Bit 071	Powerhead Gang Complete	0 or 1
Byte 09		Spindle #	1 or 2
Byte 10	Bit 080	Not Used	0 or 1
	Bit 081	Accept	0 or 1
	Bit 082	Reject	0 or 1
	Bit 083	Torque High	0 or 1
	Bit 084	Torque Low	0 or 1
	Bit 085	Angle High	0 or 1
	Bit 086	Angle Low	0 or 1
	Bit 087	Not Used	0 or 1
Byte 11	Bit 088	Not Used	0
	Bit 089	Redundancy Fault	0 or 1
	Bit 090	Spindle in Bypass	0 or 1
	Bit 091	Not Used	0
	Bit 092	Not Used	0
	Bit 093	Not Used	0
	Bit 094	Not Used	0
	Bit 095	Stats Alarm	0 or 1
Byte 12		1st Digit of Config # in ASCII	
Byte 13		2nd Digit of Config # in ASCII	
Byte 14		Torque Units: 0 = Nm 1 = ft-lbs. 2 = in-lbs. 3 = kg-m 4 = kg-cm	
Byte 15		1st digit of Torque in ASCII	
Byte 16		2nd digit of Torque in ASCII	
Byte 17		3rd digit of Torque in ASCII	
Byte 18		4th digit of Torque in ASCII	
Byte 19		5th digit of Torque in ASCII	
Byte 20		1st digit of Angle in ASCII	
Byte 21		2nd digit of Angle in ASCII	
Byte 22		3rd digit of Angle in ASCII	
Byte 23		4th digit of Angle in ASCII	
Byte 24		5th digit of Angle in ASCII	
Byte 25		Not Used	
Byte 26		Not Used	
Byte 27		Not Used	
Byte 28		Not Used	
Byte 29		Not Used	
Byte 30		Not Used	
Byte 31		1st digit of Current in ASCII	

Cycle Result with EOR Information (Continued)

STEP 2

PLC/ PC INPUTS
The Insight then sends:

Byte 00	Message Number + 1	X+1
Byte 01	Message Type	2
Byte 02	Packet Number	2
Byte 03	Number of Packets	3
Byte 04	Data Size	27

PLC/ PC OUTPUTS
PC or PLC must respond with:

Byte 00	Message Number + 1	X+1
Byte 01	Message Type	3
Byte 02	Packet Number	2
Byte 03	Number of Packets	3
Byte 04	Received Message Type	2

Byte 05	2nd digit of Current in ASCII
Byte 06	3rd digit of Current in ASCII
Byte 07	4th digit of Current in ASCII
Byte 08	5th digit of Current in ASCII
Byte 09	1st digit of Low Torque Limit in ASCII
Byte 10	2nd digit of Low Torque Limit in ASCII
Byte 11	3rd digit of Low Torque Limit in ASCII
Byte 12	4th digit of Low Torque Limit in ASCII
Byte 13	5th digit of Low Torque Limit in ASCII
Byte 14	1st digit of High Torque Limit in ASCII
Byte 15	2nd digit of High Torque Limit in ASCII
Byte 16	3rd digit of High Torque Limit in ASCII
Byte 17	4th digit of High Torque Limit in ASCII
Byte 18	5th digit of High Torque Limit in ASCII
Byte 19	1st digit of Low Angle Limit in ASCII
Byte 20	2nd digit of Low Angle Limit in ASCII
Byte 21	3rd digit of Low Angle Limit in ASCII
Byte 22	4th digit of Low Angle Limit in ASCII
Byte 23	5th digit of Low Angle Limit in ASCII
Byte 24	1st digit of High Angle Limit in ASCII
Byte 25	2nd digit of High Angle Limit in ASCII
Byte 26	3rd digit of High Angle Limit in ASCII
Byte 27	4th digit of High Angle Limit in ASCII
Byte 28	5th digit of High Angle Limit in ASCII
Byte 29	1st digit of TR Value in ASCII
Byte 30	2nd digit of TR Value in ASCII
Byte 31	3rd digit of TR Value in ASCII

Cycle Result with EOR Information (Continued)

STEP 3

PLC/ PC INPUTS
The Insight then sends:

Byte 00	Message Number + 2	X+2
Byte 01	Message Type	2
Byte 02	Packet Number	3
Byte 03	Number of Packets	3
Byte 04	Data Size	17

PLC/ PC OUTPUTS
PC or PLC must respond with:

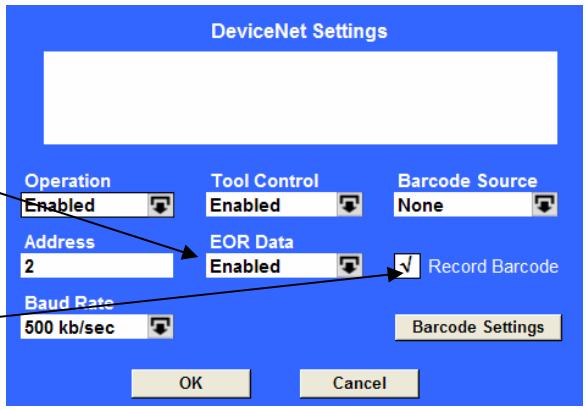
Byte 00	Message Number + 2	X+2
Byte 01	Message Type	3
Byte 02	Packet Number	3
Byte 03	Number of Packets	3
Byte 04	Received Message Type	2

Byte 05	4th digit of TR Value in ASCII
Byte 06	5th digit of TR Value in ASCII
Byte 07	1st digit of Torque Threshold in ASCII
Byte 08	2nd digit of Torque Threshold in ASCII
Byte 09	3rd digit of Torque Threshold in ASCII
Byte 10	4th digit of Torque Threshold in ASCII
Byte 11	5th digit of Torque Threshold in ASCII
Byte 12	1st digit of Free Speed in ASCII
Byte 13	2nd digit of Free Speed in ASCII
Byte 14	3rd digit of Free Speed in ASCII
Byte 15	4th digit of Free Speed in ASCII
Byte 16	5th digit of Free Speed in ASCII
Byte 17	1st digit of Shiftdown Speed in ASCII
Byte 18	2nd digit of Shiftdown Speed in ASCII
Byte 19	3rd digit of Shiftdown Speed in ASCII
Byte 20	4th digit of Shiftdown Speed in ASCII
Byte 21	5th digit of Shiftdown Speed in ASCII

Cycle Result with EOR Information and Barcode

Insight IC Setup

1. Set **EOR Data** to ”Enabled”.
2. Check “**Record Barcode**”



Cycle Result with EOR & Barcode Enabled

STEP 1

PLC/ PC INPUTS
At the end of Cycle, Insight sends:

Byte 00	Message Number	X
Byte 01	Message Type	2
Byte 02	Packet Number	1
Byte 03	Number of Packets	5
Byte 04	Data Size	27

PLC/ PC OUTPUTS
PC or PLC must respond with:

Byte 00	Message Number	X
Byte 01	Message Type	3
Byte 02	Packet Number	1
Byte 03	Number of Packets	5
Byte 04	Received Message Type	2

Byte 05		Powerhead or Spindle #	1
Byte 06		# of Spindles in Powerhead	1 or 2
Byte 07	Bit 056	EOR Enable	1
	Bit 057	Barcode Enable	1
	Bit 058	Not Used	0
	Bit 059	Not Used	0
	Bit 060	Not Used	0
	Bit 061	Not Used	0
	Bit 062	Not Used	0
	Bit 063	Not Used	0
Byte 08	Bit 064	Powerhead Accept	0 or 1
	Bit 065	Powerhead Reject	0 or 1
	Bit 066	Not Used	0
	Bit 067	Not Used	0
	Bit 068	Not Used	0
	Bit 069	Not Used	0
	Bit 070	Not Used	0
	Bit 071	Powerhead Gang Complete	0 or 1
Byte 09		Spindle #	1 or 2
Byte 10	Bit 080	Not Used	0 or 1
	Bit 081	Accept	0 or 1
	Bit 082	Reject	0 or 1
	Bit 083	Torque High	0 or 1
	Bit 084	Torque Low	0 or 1
	Bit 085	Angle High	0 or 1
	Bit 086	Angle Low	0 or 1
	Bit 087	Not Used	0 or 1
Byte 11	Bit 088	Not Used	0
	Bit 089	Redundancy Fault	0 or 1
	Bit 090	Spindle in Bypass	0 or 1
	Bit 091	Not Used	0
	Bit 092	Not Used	0
	Bit 093	Not Used	0
	Bit 094	Not Used	0
	Bit 095	Stats Alarm	0 or 1
Byte 12		1st Digit of Config # in ASCII	
Byte 13		2nd Digit of Config # in ASCII	
Byte 14		Torque Units: 0 = Nm 1 = ft-lbs. 2 = in-lbs. 3 = kg-m 4 = kg-cm	
Byte 15		1st digit of Torque in ASCII	
Byte 16		2nd digit of Torque in ASCII	
Byte 17		3rd digit of Torque in ASCII	
Byte 18		4th digit of Torque in ASCII	
Byte 19		5th digit of Torque in ASCII	
Byte 20		1st digit of Angle in ASCII	
Byte 21		2nd digit of Angle in ASCII	
Byte 22		3rd digit of Angle in ASCII	
Byte 23		4th digit of Angle in ASCII	
Byte 24		5th digit of Angle in ASCII	
Byte 25		Not Used	
Byte 26		Not Used	
Byte 27		Not Used	
Byte 28		Not Used	
Byte 29		Not Used	
Byte 30		Not Used	
Byte 31		1st digit of Current in ASCII	

Cycle Result with EOR Information and Barcode (continued)

STEP 2

PLC/ PC INPUTS
The Insight then sends:

Byte 00	Message Number + 1	X+1
Byte 01	Message Type	2
Byte 02	Packet Number	2
Byte 03	Number of Packets	5
Byte 04	Data Size	27

PLC/ PC OUTPUTS
PC or PLC must respond with:

Byte 00	Message Number + 1	X+1
Byte 01	Message Type	3
Byte 02	Packet Number	2
Byte 03	Number of Packets	5
Byte 04	Received Message Type	2

Byte 05	2nd digit of Current in ASCII
Byte 06	3rd digit of Current in ASCII
Byte 07	4th digit of Current in ASCII
Byte 08	5th digit of Current in ASCII
Byte 09	1st digit of Low Torque Limit in ASCII
Byte 10	2nd digit of Low Torque Limit in ASCII
Byte 11	3rd digit of Low Torque Limit in ASCII
Byte 12	4th digit of Low Torque Limit in ASCII
Byte 13	5th digit of Low Torque Limit in ASCII
Byte 14	1st digit of High Torque Limit in ASCII
Byte 15	2nd digit of High Torque Limit in ASCII
Byte 16	3rd digit of High Torque Limit in ASCII
Byte 17	4th digit of High Torque Limit in ASCII
Byte 18	5th digit of High Torque Limit in ASCII
Byte 19	1st digit of Low Angle Limit in ASCII
Byte 20	2nd digit of Low Angle Limit in ASCII
Byte 21	3rd digit of Low Angle Limit in ASCII
Byte 22	4th digit of Low Angle Limit in ASCII
Byte 23	5th digit of Low Angle Limit in ASCII
Byte 24	1st digit of High Angle Limit in ASCII
Byte 25	2nd digit of High Angle Limit in ASCII
Byte 26	3rd digit of High Angle Limit in ASCII
Byte 27	4th digit of High Angle Limit in ASCII
Byte 28	5th digit of High Angle Limit in ASCII
Byte 29	1st digit of TR Value in ASCII
Byte 30	2nd digit of TR Value in ASCII
Byte 31	3rd digit of TR Value in ASCII

Cycle Result with EOR Information and Barcode (continued)

STEP 3

PLC/ PC INPUTS
The Insight then sends:

Byte 00	Message Number + 2	X+2
Byte 01	Message Type	2
Byte 02	Packet Number	3
Byte 03	Number of Packets	5
Byte 04	Data Size	27

PLC/ PC OUTPUTS
PC or PLC must respond with:

Byte 00	Message Number + 2	X+2
Byte 01	Message Type	3
Byte 02	Packet Number	3
Byte 03	Number of Packets	5
Byte 04	Received Message Type	2

Byte 05	4th digit of TR Value in ASCII
Byte 06	5th digit of TR Value in ASCII
Byte 07	1st digit of Torque Threshold in ASCII
Byte 08	2nd digit of Torque Threshold in ASCII
Byte 09	3rd digit of Torque Threshold in ASCII
Byte 10	4th digit of Torque Threshold in ASCII
Byte 11	5th digit of Torque Threshold in ASCII
Byte 12	1st digit of Free Speed in ASCII
Byte 13	2nd digit of Free Speed in ASCII
Byte 14	3rd digit of Free Speed in ASCII
Byte 15	4th digit of Free Speed in ASCII
Byte 16	5th digit of Free Speed in ASCII
Byte 17	1st digit of Shiftdown Speed in ASCII
Byte 18	2nd digit of Shiftdown Speed in ASCII
Byte 19	3rd digit of Shiftdown Speed in ASCII
Byte 20	4th digit of Shiftdown Speed in ASCII
Byte 21	5th digit of Shiftdown Speed in ASCII
Byte 22	1st digit of Barcode in ASCII
Byte 23	2nd digit of Barcode in ASCII
Byte 24	3rd digit of Barcode in ASCII
Byte 25	4th digit of Barcode in ASCII
Byte 26	5th digit of Barcode in ASCII
Byte 27	6th digit of Barcode in ASCII
Byte 28	7th digit of Barcode in ASCII
Byte 29	8th digit of Barcode in ASCII
Byte 30	9th digit of Barcode in ASCII
Byte 31	10th digit of Barcode in ASCII

Cycle Result with EOR Information and Barcode (continued)

STEP 4

PLC/ PC INPUTS
The Insight then sends:

Byte 00	Message Number + 3	X+3
Byte 01	Message Type	2
Byte 02	Packet Number	4
Byte 03	Number of Packets	5
Byte 04	Data Size	27

PLC/ PC OUTPUTS
PC or PLC must respond with:

Byte 00	Message Number + 3	X+3
Byte 01	Message Type	3
Byte 02	Packet Number	4
Byte 03	Number of Packets	5
Byte 04	Received Message Type	2

Byte 05	11th digit of Barcode in ASCII
Byte 06	12th digit of Barcode in ASCII
Byte 07	13th digit of Barcode in ASCII
Byte 08	14th digit of Barcode in ASCII
Byte 09	15th digit of Barcode in ASCII
Byte 10	16th digit of Barcode in ASCII
Byte 11	17th digit of Barcode in ASCII
Byte 12	18th digit of Barcode in ASCII
Byte 13	19th digit of Barcode in ASCII
Byte 14	20th digit of Barcode in ASCII
Byte 15	21st digit of Barcode in ASCII
Byte 16	22nd digit of Barcode in ASCII
Byte 17	23rd digit of Barcode in ASCII
Byte 18	24th digit of Barcode in ASCII
Byte 19	25th digit of Barcode in ASCII
Byte 20	26th digit of Barcode in ASCII
Byte 21	27th digit of Barcode in ASCII
Byte 22	28th digit of Barcode in ASCII
Byte 23	29th digit of Barcode in ASCII
Byte 24	30th digit of Barcode in ASCII
Byte 25	31st digit of Barcode in ASCII
Byte 26	32nd digit of Barcode in ASCII
Byte 27	33rd digit of Barcode in ASCII
Byte 28	34th digit of Barcode in ASCII
Byte 29	35th digit of Barcode in ASCII
Byte 30	36th digit of Barcode in ASCII
Byte 31	37th digit of Barcode in ASCII

Cycle Result with EOR Information and Barcode (continued)

STEP 5

PLC/ PC INPUTS
The Insight then sends:

Byte 00	Message Number + 4	X+4
Byte 01	Message Type	2
Byte 02	Packet Number	5
Byte 03	Number of Packets	5
Byte 04	Data Size	3

Byte 05	38th digit of Barcode in ASCII
Byte 06	39th digit of Barcode in ASCII
Byte 07	40th digit of Barcode in ASCII

PLC/ PC OUTPUTS
PC or PLC must respond with:

Byte 00	Message Number + 4	X+4
Byte 01	Message Type	3
Byte 02	Packet Number	5
Byte 03	Number of Packets	5
Byte 04	Received Message Type	2