

## Programmers Reference, Polling the A-1519/A-1520 Targets

A-1519/A-1520 Targets do not Transmit Data until the Host Computer/Application transmits a polling request to each Target that it needs to read. The Polling request command consists of a Single Byte Code, equal to the Target Network ID

For Example: *To request a Data Packet from an A-1519 Target set to Target Network ID = 64, the host Application must transmit an ASCII 64 (40 hex)*

Polling interval by target data connection type:

Wireless Targets (ISM or ZigBee radio, 900MHz and 2.4GHz): 160 milliseconds or greater

Cabled Targets (RS-485 network): 70 milliseconds or greater

Note. The Polling Rate for Scanning Lasers (time Interval between successive requests for data, from the same Target) should be greater than or equal to the Scan Rate. For most Hamar Laser Scanners (e.g. L-719, L-740) the recommended polling rate is 4 times/second (250 milliseconds interval). Polling the same Target at a rate faster than the Laser Scan Rate is pointless because the Target will not reply with a new data packet until the Position has been refreshed by a new Laser scan.

Standard procedure for polling a Target

- a) Initialize the Active COM Port with the following Settings:
  - 19200 baud
  - No Parity
  - 8-bit word
  - 1 Stop Bit
- b) Transmit the Single Byte Request Code = Target Network ID of the Target that is being polled.
- c) Set a timeout: Wait a minimum of 60 ms for a reply. Radio I/O may require up to 160 ms.
- d) Process Data in the Input Buffer: Validate Checksum, Parse Data Packet, etc.
- e) Check Validity of Device Type, Operational Status Code, on-target Status, etc.
- f) If polling another Target, go to 'Step a'
- g) If polling the Same Target, wait until the polling interval has elapsed since 'Step a' was executed, then go to 'Step a'

## Programmers Reference, Single Axis (Standard) Application Data Packet

Packet Length: 18 bytes (Including two Checksum bytes)

BYTE 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
SOM	LEN	DEV	SN		OPC	TNI	TST	VP		VCO		BAT		TEMP		CHK	

	DEC	NOTES
	-----	-----
SOM = START OF MESSAGE	64	
LEN = LENGTH OF MESSAGE	18	
DEV = DEVICE TYPE	19,20	<i>A-1519 = 19 DEC</i>
SN= SERIAL NUMBER	00001 TO 65535	
OPC=OPERATIONAL STATUS CODE	0,3	<i>0=UNCALIBRATED, 3=CALIBRATED</i>
TNI=TARGET NETWORK ID	1 TO 99	<i>FROM EXTERNAL DIP SWITCHES</i>
TST=TARGET STATUS	0 TO 255	(See Page 4)
VP = VERTICAL POSITION, COUNTS	-32768 TO 32767	<i>1µm = 2 COUNTS (A-1519)</i>
	''	<i>1µm = 4 COUNTS (A-1520)</i>
VCO= SENSOR CENTER OFFSET	-4000 TO 4000	<i>1µm = 2 COUNTS (A-1519)</i>
	''	<i>1µm = 4 COUNTS (A-1520)</i>
BAT=BATTERY VOLTAGE	0 TO 5000	<i>MILLIVOLTS</i>
TEMP=INTERNAL TEMPERATURE (COUNTS)	-160 TO 800	<i>1 COUNT=1/16°C</i>
CHK=PACKET CHECKSUM		

NOTES:

TWO BYTE (INTEGER) VALUES (E.G. SN, CHK) ARE IN LEAST SIGNIFICANT BYTE, MOST SIGNIFICANT BYTE ORDER. EXAMPLE: BYTE 4 = 57 (39HEX), BYTE 5=48(30 HEX), THEN SN = 12345 (3039HEX).

VCO = MECHANICAL OFFSET BETWEEN THE SENSOR'S ELECTRICAL CENTER AND THE TARGET'S MECHANICAL CENTER. FOR FACTORY USE ONLY.

CHK (CHECKSUM) = TWO'S COMPLEMENT (NEGATION) OF THE SUM OF BYTES 1 TO 16

**Programmers Reference, Dual Axis Data Packet (R-1307C, R-1307-2.4ZB readouts or A-1519-2.4ZB or A-1520-2.4ZB targets)**

Packet Length: 22 bytes (Including two Checksum bytes)

BYTE 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
SOM	LEN	DEV	SN		OPC	TNI	TST	VP		VCO		BAT		TEMP		HP	
19	20	21	22														
HCO		CHK															

	DEC	NOTES
	-----	-----
SOM = START OF MESSAGE	64	
LEN = LENGTH OF MESSAGE	22	
DEV = DEVICE TYPE	19,20	<i>A-1519 = 19 DEC</i>
SN= SERIAL NUMBER	00001 TO 65535	
OPC=OPERATIONAL STATUS CODE	0,3	<i>0=UNCALIBRATED, 3=CALIBRATED</i>
TNI=TARGET NETWORK ID	1 TO 99	<i>FROM EXTERNAL DIP SWITCHES</i>
TST=TARGET STATUS	0 TO 255	(See Page 4)
VP = VERTICAL POSITION, COUNTS	-32768 TO 32767	<i>1µm = 2 COUNTS (A-1519)</i>
	''	<i>1µm = 4 COUNTS (A-1520)</i>
VCO= VERTICAL CENTER OFFSET	-4000 TO 4000	<i>1µm = 2 COUNTS (A-1519)</i>
	''	<i>1µm = 4 COUNTS (A-1520)</i>
BAT=BATTERY VOLTAGE	0 TO 5000	<i>MILLIVOLTS</i>
TEMP=INTERNAL TEMPERATURE (COUNTS)	-160 TO 800	<i>1 COUNT=1/16°C</i>
HP = HORIZONTAL POSITION, COUNTS	-32768 TO 32767	<i>1µm = 2 COUNTS (A-1519)</i>
	''	<i>1µm = 4 COUNTS (A-1520)</i>
HCO= HORIZONTAL CENTER OFFSET	-4000 TO 4000	<i>1µm = 2 COUNTS (A-1519)</i>
	''	<i>1µm = 4 COUNTS (A-1520)</i>
CHK=PACKET CHECKSUM		

**NOTES:**

TWO BYTE (INTEGER) VALUES (E.G. SN, CHK) ARE IN LEAST SIGNIFICANT BYTE, MOST SIGNIFICANT BYTE ORDER. EXAMPLE: BYTE 4 = 57 (39HEX), BYTE 5=48(30 HEX), THEN SN = 12345 (3039HEX).

VCO,HCO = MECHANICAL OFFSETS BETWEEN THE SENSOR'S ELECTRICAL CENTER AND THE TARGET'S MECHANICAL CENTER. FOR FACTORY USE ONLY.

CHK (CHECKSUM) = TWO'S COMPLEMENT (NEGATION) OF THE SUM OF BYTES 1 TO 20

## Programmers Reference, TST - Target Status Byte (All Packet Types)

BIT ORDER . EXAMPLE: 116 DEC,  
(01110100 BINARY) =>

BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
0	1	1	1	0	1	0	0

ILL: (INCIDENT LIGHT LEVEL)

0 - 11 NORMAL RANGE

12-14 CAUTION. NEAR

SATURATION

15 SATURATED

BIT 7	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
BIT 6	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1
BIT 5	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1
BIT 4	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0
ILL =>	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
											15	16	17	18	19

BACKGROUND LIGHT

PERIODICITY, SYNCHRONIZATION

MODE

PERIODICITY=>	50/100Hz	60/120Hz	NONE	UNSTABLE
BIT 3	0	0	1	1
BIT 2	0	1	0	1

USB PORT ACTIVITY INDICATOR

LASER DETECTION STATUS

BIT 1	1 = AUX. USB PORT ACTIVE	0 = RADIO/RS-485 ACTIVE
BIT 0	1 = LASER NOT DETECTED	0 = LASER DETECTED

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