ASTRA COMMUNICATION PROTOCOL (via RS232C)
Argentina specification (B0319G)

26 Oct 2004

1. PROTOCOL

METHOD	RS232C HALF DUPLEX
TRANSMISSION CONTROL PROCEDURE	BASIC PROCEDURE, CONTENTION MEHOD
BAUD RATE	38,400 BPS
DATA BIT	8 BIT
STOP BIT	1 BIT
PARITY	NO
DATA COMMUNCATION ORDER	FROM LSB TO MSB
CONNECTOR	9 PIN D-SUB CONNECTOR
COMMUNICATING PRODUCTS	PC, ASTRA
RESPONSE DELAY	AFTER TRANSMISSION, MAX. 500 MS DELAY UNTIL RECEIPT

2. COMMUNICATION CONTENTS

2-1. STORE NAME / ADDRESS MASTER DATA
2-2. PRESET KEY MASTER DATA
2-3. ITEM MASTER (PLU FILE) DATA
2-4. EXTRA MESSAGE MASTER DATA
2-5. ROM SWITCH DATA
2-6. PRODUCTION TOTAL DATA
2-7. DATA FINISH COMMAND

3. FORMAT

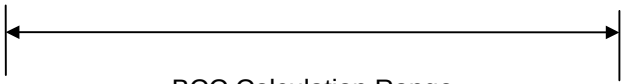
3-1. CONTROL CODE

STX	0x02
ETX	0x03
BCC	The value calculated from BDN to ETX and from 0(0x00) to XOR
CMD	TRANSMISSION DATA ZONE
BDN	Board Number 0x31 (fixed with ASCII '1')
Message	Characters Rows (Max. 250 byte)
FRN	Frame Number (0x00 - 0x2f) 0 (0x00) at the case that length of characters rows is less than 250 byte Represents the numbers of continuous data if it is more than 250 byte
CLD	Characters Length Data (0x01 - 0xFA)
STS	Error Status ('0' - '7')

3-2. Code Command style

Basic Data style

STX	BDN	Command	ETX	BCC
1	1	1	1	1



BCC Calculation Range

Transmit the kinds of sending data before sending the actual data

Transmit data by next response (acknowledgment and non-acknowledgment) after sending this command signal.

3-2-1. STORE NAME ADDRESS TRANSMISSION COMMAND 'S'

Send this 'S' command before sending store name address data

Command: Transmit → Receive

STX	BDN	'S'	ETX	BCC
1	1	1	1	1

Acknowledgment Response

Receive → Transmit

STX	BDN	'1'	'S'	ETX	BCC
1	1	1	1	1	1

Non-acknowledgment Response

Receive → Transmit

STX	BDN	'0'	STS	ETX	BCC
1	1	1	1	1	1

'0'	Invalid Text Receipt
'1'	UNDEFINED
'2'	UNDEFINED
'3'	UNDEFINED
'4'	UNDEFINED
'5'	UNDEFINED
'6'	UNDEFINED
'7'	UNDEFINED

STS (Error Status)

3-2-2. Preset Data Transmission Command 'P'

Send this 'P' Command before transmitting Preset Data

Command: Transmit → Receive

STX	BDN	'P'	ETX	BCC
1	1	1	1	1

Acknowledgment Response

Receive → Transmit

STX	BDN	'1'	'P'	ETX	BCC
1	1	1	1	1	1

Non-acknowledgment Response

Receive → Transmit

STX	BDN	'0'	STS	ETX	BCC
1	1	1	1	1	1

'0'	Invalid Text Receipt
'1'	UNDEFINED
'2'	UNDEFINED
'3'	UNDEFINED
'4'	UNDEFINED
'5'	UNDEFINED
'6'	UNDEFINED
'7'	UNDEFINED

3-2-3. ITEM MASTER DATA TRANSMISSION COMMAND 'I'

Send this 'I' command before sending Item Master Data

Command: Transmit → Receive

STX	BDN	'I'	ETX	BCC
1	1	1	1	1

Acknowledgment Response

Receive → Transmit

STX	BDN	'1'	'I'	ETX	BCC
1	1	1	1	1	1

Non-acknowledgment Response

Receive → Transmit

STX	BDN	'0'	STS	ETX	BCC
1	1	1	1	1	1

'0'	Invalid Text Receipt
'1'	UNDEFINED
'2'	UNDEFINED
'3'	UNDEFINED
'4'	UNDEFINED
'5'	UNDEFINED
'6'	UNDEFINED
'7'	UNDEFINED

3-2-4. Extra Message Master Data Transmissions 'M'

Send this 'M' Command before sending Extra Message Master Data

Command: Transmit → Receive

STX	BDN	'M'	ETX	BCC
1	1	1	1	1

Acknowledgment Response

Receive → Transmit

STX	BDN	'1'	'M'	ETX	BCC
1	1	1	1	1	1

Non-acknowledgment Response

Receive → Transmit

STX	BDN	'0'	STS	ETX	BCC
1	1	1	1	1	1

'0'	Invalid Text Receipt
'1'	UNDEFINED
'2'	UNDEFINED
'3'	UNDEFINED
'4'	UNDEFINED
'5'	UNDEFINED
'6'	UNDEFINED
'7'	UNDEFINED

3-2-5. ROM SWITCH DATA Transmission Command 'C'

Send this 'C' Command before sending ROM SWITCH DATA

Command: Transmit → Receive

STX	BDN	'C'	ETX	BCC
1	1	1	1	1

Acknowledgment Response

Receive → Transmit

STX	BDN	'1'	'M'	ETX	BCC
1	1	1	1	1	1

Non-acknowledgment Response

Receive → Transmit

STX	BDN	'0'	STS	ETX	BCC
1	1	1	1	1	1

'0'	Invalid Text Receipt
'1'	UNDEFINED
'2'	UNDEFINED
'3'	UNDEFINED
'4'	UNDEFINED
'5'	UNDEFINED
'6'	UNDEFINED
'7'	UNDEFINED

3-2-6. PRODUCTION TOTAL Data Transmission 'T'

Send this 'T' Command before sending PRODUCTION TOTAL Data

Command: Transmit → Receive

STX	BDN	'T'	ETX	BCC
1	1	1	1	1

Acknowledgment Response

Receive → Transmit

STX	BDN	'1'	'M'	ETX	BCC
1	1	1	1	1	1

Non-acknowledgment Response

Receive → Transmit

STX	BDN	'0'	STS	ETX	BCC
1	1	1	1	1	1

'0'	Invalid Text Receipt
'1'	UNDEFINED
'2'	UNDEFINED
'3'	UNDEFINED
'4'	UNDEFINED
'5'	UNDEFINED
'6'	UNDEFINED
'7'	UNDEFINED

3-2-7. Data Finish Command 'E'

Send this 'E' data in the case that the transmission such as store name address data, preset key data, item master data, etc. is transmitted completely.

Command: Transmit → Receive

STX	BDN	'E'	ETX	BCC
1	1	1	1	1

Acknowledgment Response

Receive → Transmit

STX	BDN	'1'	'E'	ETX	BCC
1	1	1	1	1	1

Non-acknowledgment Response

Receive → Transmit

STX	BDN	'0'	STS	ETX	BCC
1	1	1	1	1	1

'0'	Invalid Text Receipt
'1'	UNDEFINED
'2'	UNDEFINED
'3'	UNDEFINED
'4'	UNDEFINED
'5'	UNDEFINED
'6'	UNDEFINED
'7'	UNDEFINED

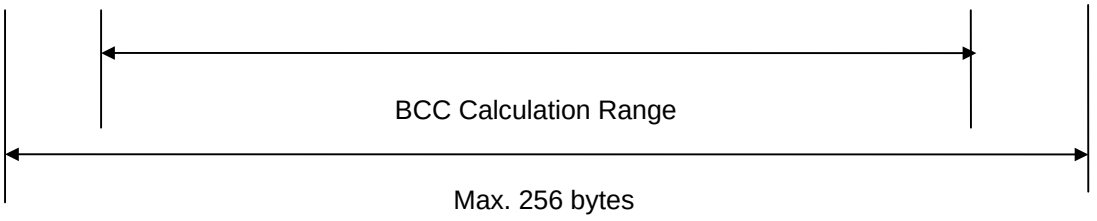
3-3. DATA SENTENCE

Transmit one form if the actual transmission data is less than 250 bytes. If it is more 250 bytes, then transmit 250 bytes each.

Don't exceed 256 byte of total frame data length including STX, ETC, BCC, EC.

Basic Data Style

STX	BDN	FRN	CLD	Message (Max. 250 bytes)	ETX	BCC
1	1	1	1	250	1	1



3-3-1. Less than 250 bytes

Frame Number is fixed with 0x00, and CLD represents length of transmitting data.

Command transmit→Receive

STX	BDN	FRN	CLD	Message	ETX	BCC
1	1	1	1	max. 250	1	1

Acknowledgment Response

Receive → Transmit

STX	BDN	'1'	'CMD'	ETX	BCC
1	1	1	1	1	1

Non-acknowledgment Response

Receive → Transmit

STX	BDN	'0'	STS	ETX	BCC
1	1	1	1	1	1

'0'	Invalid Text Receipt
'1'	UNDEFINED
'2'	UNDEFINED
'3'	UNDEFINED
'4'	UNDEFINED
'5'	UNDEFINED
'6'	UNDEFINED
'7'	UNDEFINED

3-3-2. Exceed 250 byte

FRN represents the counts of the following data.

For example, if 5 frames are transmitted in the row, transmit with the order of 4,3,2,1,0.

CLD is fixed at max. 250 if the first and middle frame is transmitted, and the last frame represents the remaining length.

Command transmit→Receive

STX	BDN	FRN	CLD	Message	ETX	BCC
1	1	1	1	max. 250	1	1

Acknowledgment Response

Receive → Transmit

STX	BDN	'1'	'CMD'	ETX	BCC
1	1	1	1	1	1

Non-acknowledgment Response

Receive → Transmit

STX	BDN	'0'	STS	ETX	BCC
1	1	1	1	1	1

'0'	Invalid Text Receipt
'1'	UNDEFINED
'2'	UNDEFINED
'3'	UNDEFINED
'4'	UNDEFINED
'5'	UNDEFINED
'6'	UNDEFINED
'7'	UNDEFINED

3-4. EXAMPLES

3-4-1. TRANSMIT 150BYTE STORE NAME ADDRESS DATA

Command transmit→Receive

STX	BDN	'S'	ETX	BCC
0x02	0x31	0x53	0x03	?

Acknowledgment Response
Receive → Transmit

STX	BDN	'1'	'S'	ETX	BCC
0x02	0x31	0x31	0x53	0x03	?

Data Transmit →Receive

STX	BDN	FRN	CLD	Message	ETX	BCC
0x02	0x31	0x00	0x96	150 Byte	0x03	?

Acknowledgment Response
Receive → Transmit

STX	BDN	'1'	'S'	ETX	BCC
0x02	0x31	0x31	0x53	0x03	?

Finish Command
Transmit → Receive

STX	BDN	'E'	ETX	BCC
0x02	0x31	0x53	0x03	?

Acknowledgment Response
Receive → Transmit

STX	BDN	'1'	'E'	ETX	BCC
0x02	0x31	0x31	0x53	0x03	?

3-4-2. Transmit 450 byte Item Master Data

Command transmit→Receive

STX	BDN	'I'	ETX	BCC
0x02	0x31	0x49	0x03	?

Acknowledgment Response
Receive → Transmit

STX	BDN	'1'	'I'	ETX	BCC
0x02	0x31	0x31	0x49	0x03	?

Data Transmit →Receive

STX	BDN	FRN	CLD	Message	ETX	BCC
0x02	0x31	0x00	0xfa	250 Byte	0x03	?

Acknowledgment Response
Receive → Transmit

STX	BDN	'1'	'I'	ETX	BCC
0x02	0x31	0x31	0x49	0x03	?

Data Transmit →Receive

STX	BDN	FRN	CLD	Message	ETX	BCC
0x02	0x31	0x00	0xc8	200 Byte	0x03	?

Acknowledgment Response
Receive → Transmit

STX	BDN	'1'	'I'	ETX	BCC
0x02	0x31	0x31	0x49	0x03	?

Finish Command
Transmit → Receive

STX	BDN	'E'	ETX	BCC
0x02	0x31	0x53	0x03	?

Acknowledgment Response
Receive → Transmit

STX	BDN	'1'	'E'	ETX	BCC
0x02	0x31	0x31	0x53	0x03	?

3-4-3. TRANSMIT 150BYTE STORE NAME ADDRESS DATA AND 3 ITEMS OF 150BYTE ITEM MASTER DATA

Command transmit→Receive

STX	BDN	'S'	ETX	BCC
0x02	0x31	0x53	0x03	?

Acknowledgment Response
Receive → Transmit

STX	BDN	'1'	'S'	ETX	BCC
0x02	0x31	0x31	0x53	0x03	?

Data Transmit →Receive

STX	BDN	FRN	CLD	Message	ETX	BCC
0x02	0x31	0x00	0x96	150 Byte	0x03	?

Acknowledgment Response
Receive → Transmit

STX	BDN	'1'	'S'	ETX	BCC
0x02	0x31	0x31	0x53	0x03	?

Command transmit→Receive

STX	BDN	'I'	ETX	BCC
0x02	0x31	0x49	0x03	?

Acknowledgment Response
Receive → Transmit

STX	BDN	'1'	'I'	ETX	BCC
0x02	0x31	0x31	0x49	0x03	?

Data Transmit →Receive

STX	BDN	FRN	CLD	Message	ETX	BCC
0x02	0x31	0x00	0xc8	150 Byte	0x03	?

Acknowledgment Response
Receive → Transmit

STX	BDN	'1'	'I'	ETX	BCC
0x02	0x31	0x31	0x49	0x03	?

Data Transmit →Receive

STX	BDN	FRN	CLD	Message	ETX	BCC
0x02	0x31	0x00	0xc8	150 Byte	0x03	?

Acknowledgment Response
Receive → Transmit

STX	BDN	'1'	'I'	ETX	BCC
0x02	0x31	0x31	0x49	0x03	?

Data Transmit →Receive

STX	BDN	FRN	CLD	Message	ETX	BCC
0x02	0x31	0x00	0xc8	150 Byte	0x03	?

Acknowledgment Response
Receive → Transmit

STX	BDN	'1'	'I'	ETX	BCC
0x02	0x31	0x31	0x49	0x03	?

Finish Command
Transmit → Receive

STX	BDN	'E'	ETX	BCC
0x02	0x31	0x45	0x03	?

Acknowledgment Response
Receive → Transmit

STX	BDN	'1'	'E'	ETX	BCC
0x02	0x31	0x31	0x45	0x03	?

Send 'E' after send all the 3 items data by dividing 250 byte and 200 byte if 450 byte of PLU date is sent three times. In the case that the plural different file is transmitted, transmit 'E' command after sending all the files. ASTRA finish when it receive 'E' command. Data back-up can be done at special data back-up mode only which prohibits changing task. In other mode except for data back-up mode, it repeats non-acknowledgment. In the case of no response after transmission, transmit again after 500ms. In the case of no response after transmission three times and reception of non-acknowledgment, treat pre-defined error management.

5. DATA LAYOUT

Characters --- One font by one line

Characters Range (one line)		
1 byte	**1 byte**	**characters**
0x0d (CR code)	**Font #**	

Characters Fonts Kinds			
Standard Font	Font #	Italic Font	Font #
F014x07	03H	I014x07	11H
F020x10	08H	I020x10	12H
F030x15	0DH	I030x15	13H
F040x20	F0H	I040x20	F4H
F060x30	F1H	I060x30	F5H
F080x40	F2H	I080x40	F6H
F120x60	F3H	I120x60	F7H

5-1 STORE NAME ADDRESS MASTER

STORE #	ADDRESS CHARACTERS	ADDRESS	STORE NAME CHARACTERS	STORE NAME
2 BYTE	2 BYTE	MAX 99 BYTE	2 BYTE	MAX 99 BYTE
		CHARACTERS		CHARACTERS

5-2. ITEMS MASTER

PLU No.	Mode	Unit Price / Fixed Price	Fixed Weight	Fixed Price Pieces	Tare	Date Printing	Shelf Life
3 byte	1 byte	4 byte	3 byte	1 byte	2 byte	1 byte	2 byte
6digit(BCD)	1digit(BCD)	8digit(BCD)	5digit(BCD)	2digit(BCD)	4digit(BCD)	1digit(BCD)	3digit(BCD)

Item Code	Extra Message	Filler	Filler	Filler	Character Numbers of Commodity	Commodity Names
4 byte	1 byte	1 byte	1 byte	2 byte	2 byte	Max. 1027
8digit(BCD)	2digit(BCD)					Characters

Weighing Mode	0: Weighing 1: Fixed Price
Date Print Flag	0: Refer, 1: Prohibit 2: Packed Date only 3: Expiry Date only 4: Both

Fixed Price Pieces	'PCS' only

5-3 Preset Key

Preset No.	Preset Type	Data
1 byte	1 byte	3 byte
Hexadecimal	hexadecimal	6 digit(BCD)

Put null data in the case except for PLU No. Or Tare

Preset Type

0x00	Not use	0x08	SAVE
0x01	PLU	0x09	Extra Message
0x02	Tare	0x0a	VOID
0x03	Fixed Price	0x0b	Peel Timer
0x04	X	0x0c	99
0x05	Special Price	0x0d	00
0x06	-$	0x0e	Not use
0x07	-%		

01 2d	02 2e	03 2f	04 30	05 31	06 32	07 33	08 34	
09 35	0a 36	0b 37	0c 38	0d 39	0e 3a	0f 3b	10 3c	11 3d
12 3e	13 3f	14 40	15 41	16 42	17 43	18 44	19 45	1a 46
1b 47	1c 48	1d 49	1e 4a	1f 4b	20 4c	21 4d	22 4e	23 4f
24 50	25 51	26 52	27 53	28 54	29 55	2a 56	2b 57	2c 58

Preset Key Location

5-4. Extra Message Master

Extra Message No.	Numbers of characters	Characters
1 byte	3 byte	Max. 1027

5-4. Production Total

PLU	Quantity	Weight	Total Price
3byte	3byte	4byte	4byte
BCD	BCD	BCD	BCD

6-1. ASTRA Communication Menu Configuration

Menu	Description
P10	>REGISTRATION
P10-00	>COMMUNICATION
P10-01	>UP LOAD
P10-01-01	>ALL UP LOAD
P10-01-02	>SHOP UP LOAD
P10-01-03	>ITEM UP LOAD
P10-01-04	>PRESET UP LOAD
P10-01-05	>MESG UP LOAD
P10-01-06	>FONT UP LOAD
P10-01-07	>CONFG UP LOAD
P10-01-08	>TOTAL DATA
P10-02	>DOWN LOAD

6-2. Menu Function: formed by “UP LOAD” and “DOWN LOAD” Menu

>UP LOAD	Data transfer to other Astra scale or PC
>ALL UP LOAD	Transfer all master data (Note) Except Total data
>SHOP UP LOAD	Transfer Store Name/Address
>ITEM UP LOAD	Transfer Item master data
>PRESET UP LOAD	Transfer Preset function key data
>MESG UP LOAD	Transfer Extra message data
>FONT UP LOAD	Transfer Label format data
>TOTAL DATA	Transfer Production total data
>CNFG UP LOAD	Transfer E2ROM data
>DOWN LOAD	Data receive from other Astra scale or PC

6-3. Explanation

All data transfer operation is available only under condition of prohibition “Task Transfer” at Astra Scale.

That is to say, it works in “UP LOAD” and “DOWN LOAD” Menu.

A）Case1: Data transfer from Astra（A） to Astra(B)

- Set “DOWN LOAD” mode on Astra (B)

  Select [Enter]key——Waiting status with display ”——— DOWN LOADING ———”

- Select desired data file to transfer from “UP LOAD” menu on Astra(A)”

Select [Enter]key ——Start transferring with display ”———UP LOADING ———” .

Receiving data from Astra(A),then Astra(B) start data transfer with display “——— DOWN LOADING ———”.

- After completing data transfer correctly、then Astra(A) display “——— UP LOAD OK ———”,Astra(B) display “——— DOWN LOAD OK ———”,after that return to “UP LOAD” and “Down LOAD”.

D) Case4: Data transfer from PC to Astra

- Set Astra to “Normal” mode in advance.
- Data transfer from PC.
- After completing data transfer correctly、then Astra displays “——— DOWN LOAD OK ———” 3sec. ,then return to “Normal” mode.

  In case of data transfer error, Astra displays “——— DOWN LOAD ERROR ———” 3sec, then return to “Normal” mode.

D) Case5: Data transfer from Astra to PC.

- Set Astra to “Normal” mode in advance.
- Data transfer from PC.
- After completing data transfer correctly、then Astra displays “——— UP LOAD OK ———” 3 times ,then return to “Normal” mode.

In case of data transfer error, Astra displays “——— UP LOAD ERROR ———” 3 times, then return to “Normal” mode.

Astra Data receiving method

A) PC to ASTRA: Add: Add transferred data to existing data.

B) PC to ASTRA: Overwrite: Overwrite transferred data after deletion existing data.

C) ASTRA to PC: Astra sends to required data to PC. Astra sends required data by using associated command A.
(Example: PLU data ---> PC sends “J” command to Astra. Astra sends back “I” command to PC)

	Command A	Command B	Command C
PLU	I	I	J
SHOP	S	s	R
EXTRA MESSAGE	M	m	N
PRESET KEY	P	p	Q
ROM SWICTH	C	c	N/A
TOTAL	T	t	U