

Section 8

Communications Gateway

VMC/Peripheral Communication Specifications

8.1 Introduction

This section defines the communications bytes sent and received between a Communications Gateway (Comms Gateway) and the VMC. The Comms Gateway address is 00011xxxB (18H).

Unless otherwise stated, all information is assumed to be in a binary format.

After the VMC has issued a command, the Comms Gateway must respond with a reply. The reply may be an ACK or a detailed message response. If the command format expects a response, the Comms Gateway may: 1) respond with an ACK, to acknowledge receiving the command, and send the response later as a response to a POLL, or 2) immediately respond with the expected message.

The Comms Gateway response to a command from the VMC may be an ACK, a single message, or if there is more data to send it may be a multi message reply, up to the MDB maximum of 36 bytes.

The following command / response set has been defined to provide a means to transfer vending information system data from the VMC to the Comms Gateway in one of two ways;

- 1) Entire DTS files (including DXS, ST, SD1, G85, SE, and DXE records) are transferred using the file transport layer (FTL) of MDB.
- 2) Activity "Reports" are sent from the VMC to the Comms Gateway every time something happens in the vending system, it is then the Comms Gateways responsibility to store and assemble the DTS file. (DXS, ST, SD1, G85, SE and DXE data are not sent.) Obviously, a combination of these two methods can be designed to meet specific needs also.

8.2 VMC Commands

VMC Cmd	Code	VMC Data	Comm Gateway response
RESET	18H		00H - Just RESET (1)
SETUP	19H	Feature level (1) Scale factor (1) Decimal places (1)	01H - Comms Gateway Config (1) Feature level (1) Max. App. Resp. (2)
POLL	1AH		00H - Just RESET (1) 01H - Comms Gateway Config (1) Feature level (1) Max. App. Resp. (2) 02H - Request transmit (1) 03H - Data transmitted (1) 04H - Error (1) Error code (n) 05H - DTS Event Acknowledge (1) 06H - Peripheral ID: (1) Mfg. code (3) Serial number (12) Model number (12) Software ver. (2) Opt. features (4) 07H - Radio Signal Strength (2) 1BH - FTL REQ to RCV (option) (1) 1CH - FTL RETRY / DENY (option) (1) 1DH - FTL SEND BLOCK (option) (1) 1EH - FTL OK to SEND (option) (1) 1FH - FTL REQ to SEND (option) (1) FFH - Diagnostics (n)
REPORT	1BH	Type = 01, Transaction (1) Transaction Type (1) Selection (Row/Col.) (2) Price (2) Cash in, Coin tubes (2) Cash in, Cashbox (2) Cash in, Bills (2) Value in, Cashless #1 (2) Value in, Cashless #2 (2) Revalue to Cashless #1 (2) Revalue to Cashless #2 (2) Cash out (2) Discount Amount (2) Surcharge Amount (2) User Group # (1) Price List (1) Date (4) Time (2)	

		Type = 02, DTS Event (1) DTS Event Code (10) Date (4) Time (2) Duration (4) Activity (1) Terminal ID (12)	05-DTS Event Acknowledge (1)
		Type = 03, Asset ID (1) Asset Type = 0n (1) Manufacture Code (3) Serial Number (12) Model Number (12) Software Version (2)	
		Type = 03, Asset ID (1) Asset Type = 8n (1) Asset Number (20)	
		Type = 04, Currency ID (1) VMC Currency Code (2) VMC Currency (1) VMC Decimal Point (1)	
		Type = 05, Product ID (1) Product Identification (20) Selection Presence (1)	
CONTROL	1CH	00H - Disable (1)	
		01H - Enable (1)	
		02H - Transmit (1)	
EXPANSION	1FH	00H - Identification	06H - Peripheral ID: (1) Mfg. code (3) Serial number (12) Model number (12) Software ver. (2) Opt. features (4)
		01H - Feature enable (1) Features enabled (4)	
		FAH - FTL (option) REQ TO RCV	1DH - SEND BLOCK 1CH - RETRY / DENY
		FBH - FTL (option) RETRY / DENY	No Data
		FCH - FTL (option) SEND BLOCK	No Data
		FDH - FTL (option) OK TO SEND	1DH - SEND BLOCK
		FEH - FTL (option) REQ TO SEND	1EH - OK TO SEND 1CH - RETRY/DENY
		FFH - Diagnostics (n)	FFH - Diagnostics (n)

8.3 Communications Gateway Command Format

VMC Command	Code/Sub-code	VMC Data	Comms Gateway Response
RESET	18H	No data	Z1

This command is the vehicle that the VMC should use to tell the Comms Gateway that it should perform its initialization procedure. With the exception of the ACK response, it should abort all communication and revert to the internally stored operational parameters.

Z1 = 00 JUST RESET

Indicates the Comms Gateway has been reset internally or on command from the VMC.

The following initialization sequence is recommended. It should be used after “power up”, after issuing the RESET command, or after issuing the Bus Reset (pulling the transmit line “active” for a minimum of 100 mS).

POLL – 18H

To obtain “JUST RESET” response

SETUP – 19H

To obtain Comms Gateway level and configuration information

EXPANSION IDENTIFICATION – 1F 00H

To obtain additional identification information and options

EXPANSION FEATURE ENABLE – 1F 01H

To enable desired options

CONTROL / ENABLE – 1CH / 01H

To enable / alert the Comms Gateway to start collecting data and / or monitoring for REPORT commands situations.

VMC Command	Code/Sub-code	VMC Data	Comms Gateway Response
SETUP	19H	Y1 - Y3	Z1 - Z4

Y1 = VMC feature level

Indicates the highest Comms Gateway feature level that the VMC supports. Currently the highest feature level is 03, with no requirement to support previous (obsolete) levels 1 and 2.)

Y2 = Scale factor

The multiplier used to scale all monetary values transferred between the VMC and the Comms Gateway.

Y3 = Decimal places

The number of decimal places used to communicate monetary values between the VMC and the Comms Gateway.

Z1 = 01 COMMS GATEWAY CONFIGURATION

The Comms Gateway is responding to a SETUP command. This response includes the following data;

Z2 = Comms Gateway feature level

The feature level of the Comms Gateway. Currently the highest feature level is 03, with no requirement to support previous (obsolete) levels 1 and 2.)

Z3 - Z4 = Application maximum response time

The maximum length of time, in seconds, that an Comms Gateway may be unable to respond to any commands. This includes the time communicating over an external network. The VMC should continue POLLing the Comms Gateway during this time in an attempt to re-synchronize communications earlier. When the Comms Gateway is ready to communicate over the bus again, it should respond to the next POLL with COMPLETE (if communicating externally) or ACK. This time essentially replaces the standard MDB non-response time, as such it's default value is equal to the defined non-response time (5 seconds).

<u>VMC Command</u>	<u>Code/Sub-code</u>	<u>VMC Data</u>	<u>Comms Gateway Response</u>
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POLL	1AH	No data	Z1 - Zn
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The POLL command is used by the VMC to obtain information from the Comms Gateway. This information may include setup information, activity requests, or error conditions. An ACK response indicates that no error states exist and either no information request is pending or pending information is not yet ready for transmission.

In addition to an ACK, the VMC may receive the following POLL responses from the Comms Gateway.

- Z1 = 00 JUST RESET
- Indicates the Comms Gateway has been reset internally or on command from the VMC.
- Z1 = 01 COMMS GATEWAY CONFIGURATION
- The Comms Gateway is responding to a SETUP command. This response includes the following data;
- Z2 = Comms Gateway feature level
- The feature level of the Comms Gateway. Currently the highest feature level is 03, with no requirement to support previous (obsolete) levels 1 and 2.)
- Z3 - Z4 = Application maximum response time
- The maximum length of time, in seconds, that an Comms Gateway may be unable to respond to any commands. This includes the time communicating over an external network. The VMC should continue POLLing the Comms Gateway during this time in an attempt to re-synchronize communications earlier. When the Comms Gateway is ready to communicate over the bus again, it should respond to the next POLL with COMPLETE (if communicating externally) or ACK. This time essentially replaces the standard MDB non-response time, as such it's default value is equal to the defined non-response time (5 seconds).
- Z1 = 02 REQUEST TO TRANSMIT
- The Comms Gateway is requesting permission to transmit data to an external collection device. This is done to control the bus power supply. The Comms Gateway should continue sending this response to each POLL until permission to transmit has been granted or the need to transmit goes away.
- Z1 = 03 DATA TRANSMITTED
- The Comms Gateway is finished transmitting to an external collect device.
- Z1 = 04 ERROR
- The Comms Gateway has developed some type of detectable error. The error codes will be sent continuously, or until the error is resolved.
- Z2 – Zn = Error code
- The error codes are ASCII strings taken from the EVA DTS Communications fault list.

Z1 = 05 DTS EVENT ACKNOWLEDGE

The Comms Gateway has recognized that a DTS Event has occurred and must act accordingly. The specific actions will be defined by the Comms Gateway operational specifications.

Z1 = 06H PERIPHERAL ID

Comms Gateway is sending peripheral ID information. This response includes the following data;

Z2 - Z4 = Manufacturer code

Identification code for the equipment supplier. Sent as ASCII characters. Blanks (20H) are acceptable.

Z5 - Z16 = Serial number

Factory assigned serial number sent as numeric ASCII characters. All bytes must be sent. Zeros (30H) and blanks (20H) are acceptable.

Z17 - Z28 = Model number ASCII.

Manufacturer assigned model number sent as ASCII characters. All bytes must be sent. Zeros (30H) and blanks (20H) are acceptable.

Z29 - Z30 = Software version

Current software version sent as packed BCD.

Z31 - Z34 = Optional Features

Each of the 32 bits indicate an optional features availability. If the bit is set the feature is available. Currently defined options are:

b0: File transport layer support
b1: Verbose mode: See REPORT command
b2 - b31: Future use, must be set to 0.

Z1 = 07H RADIO SIGNAL STRENGTH

The Comms Gateway is reporting its signal strength from the network. This response includes the following data;

Z2 = Signal Strength

The level of radio signal strength detected by the Comms Gateway. This is a binary number from 00H to 64H (100%) representing the percentage of expected signal. This can be sent after every POLL, or as needed due to changes in the signal.

Note that all FTL responses below are defined in Section 2.6. For the Comms Gateway, the source address will always be the Comms Gateway (18H) as defined in Section 2.3.

Z1 = 1BH REQ TO RCV (File Transport Layer)

The Comms Gateway is requesting to receive data from a device or VMC.

Z2 = Destination address of response

Z3 = Source address of response (18H)

Z4 = File ID

Z5 = Maximum length

Z6 = Control

Z1 = 1CH RETRY/DENY (File Transport Layer)

The Comms Gateway is requesting a device or VMC to retry or deny the last FTL command.

Z2 = Destination address of response

Z3 = Source address of response (18H)

Z4 = Retry delay

Z1 = 1DH SEND BLOCK (File Transport Layer)

The Comms Gateway is sending a block of data (maximum of 31 bytes) to a device or VMC.

Z2 = Destination address of data

Z3 = Block #

Z4-Z34 = Data (maximum of 31 bytes)

Z1 = 1EH OK TO SEND (File Transport Layer)

The Comms Gateway is indicating that it is OK for a device or VMC to send it data.

Z2 = Destination address of response

Z3 = Source address of response (18H)

Z1 = 1F REQ TO SEND (File Transport Layer)

The Comms Gateway is requesting to send data to a device or VMC.

- Z2 = Destination address of response
- Z3 = Source address of response (18H)
- Z4 = File ID
- Z5 = Maximum length
- Z6 = Control

Z1 = FFH DIAGNOSTICS

The Comms Gateway is responding to a EXPANSION/DIAGNOSTICS command. This response includes the following data;

Z2 - Zn User defined data

Device manufacturer specific responses after receiving manufacturing or test instructions. Z1 - Zn implies that any number of bytes may be used for the response data from the Comms Gateway.

VMC Command Code/Sub-code VMC Data Comms Gateway Response

REPORT 1BH Y1 – Ynn No data

The REPORT command is used by the VMC to pass activity information to the Comms Gateway. If the “Verbose mode” is enabled via the EXPANSION / FEATURE ENABLE command, this command must be sent immediately following the completion of any activity it is describing. The activities may include; a transaction, a DTS defined event, an asset identification, currency identification, or product identification.

The intent of this command is to provide information so that the Comms Gateway can create a Data Transfer Standard file. All of the following fields show their corresponding DTS fields for reference, for further detail refer to the Data Transfer Standard.

If the “Verbose mode” is disabled, only the “DTS Event” report type records must be sent. This mode uses the FTL to transfer the complete DTS files and the DTS Event report types to alert the VMC of any alarm conditions.

Since reports data may vary, any field that is not relevant, or not known, should be populated with 00H’s. All cash values are scaled and decimal adjusted using the data provided in the SETUP command.

Y1 = Type: The type of activity that is being reported, includes one of the following:

01H	Transaction
02H	DTS Event
03H	Asset ID
04H	Currency ID
05H	Product ID

If Y1 = 01H then the following “Transaction” data fields have been identified to be included:

Y2 = Transaction Type

This field defines the type of transaction that the following data describes. The defined transaction types include;

01H	Paid Vend
02H	Token Vend
03H	Free Vend
04H	Test Vend
05H	Revalue
06H	Negative Vend
07H	Vendless*
08H	Manual / Service

* The end of a “Vendless” transaction is defined by the VMC manufacturer, for example an escrow request, a failed vend, etc.

Y3 – Y4 = Item Number

This is the binary field used to link REPORT type 01 to REPORT type 05. It is an item number, 0000H through FFFFH of the selected product involved in the most recent transaction. This number is defined by the manufacturer.

Y5 – Y6 = Price (PA102)

The established price of the product involved in the most recent transaction. The established price is the price before any adjustments i.e. discounts surcharges, etc.

Y7 – Y8 = Cash in, Coin Tubes (CA303/CA307 or CA1001/CA1002)

The value of cash deposited into the coin tubes since the completion of the previous transaction.

Y9 – Y10 =	Cash in, Cashbox	(CA302/CA306)
	The value of cash deposited into the cashbox since the completion of the previous transaction.	
Y11 – Y12 =	Cash in, Bills	(CA304/CA308)
	The value of cash deposited into the bill stacker since the completion of the previous transactions.	
Y13 – Y14 =	Value in, Cashless Device #1	(DA201/DA203)
	The value removed from the media in cashless device #1 since the completion of the previous transaction.	
Y15 – Y16 =	Value in, Cashless Device #2	(DB201/DB203)
	The value removed from the media in cashless device #2 since the completion of the previous transaction.	
Y17 – Y18 =	Revalue to Cashless Device #1	(DA401/DA402)
	The value returned to the media in cashless device #1 since the completion of the previous transaction.	
Y19 – Y20 =	Revalue to Cashless Device #2	(DB401/DB402)
	The value returned to the media in cashless device #2 since the completion of the previous transaction.	
Y21 – Y22 =	Cash out	(CA401/CA403 or CA402/CA404)
	The total value of the cash dispensed from the system since the completion of the previous transaction.	
Y23 – Y24 =	Discount Amount	(CA701/CA702)
	The value of any discounts awarded since the completion of the previous vend.	
Y25 – Y26 =	Surcharge Amount	(CA705/CA706)
	The value of any surcharges collected since the completion of the previous vend.	
Y27 =	User Group #	(DA701 or DB701)

The user group number that the transaction is associated with.

Y28 = Price List (LA101)

The price list that the transaction is associated with

Y29 – Y32 = Date (PA501)

The date of the transaction. This data is sent as BCD in the following sequence YYYY/MM/DD. For example, 17 March 2002 would be 20H 02H 03H 17H. If the date is not known these bytes are filled with 99Hs.

Y33 – Y34 = Time (PA502)

The time of the transaction. This data is sent as BCD , 24 hour format, in the following sequence HHMM. For example, 6:30 PM would be 18H 30H. If the time is not known these bytes are filled with 99Hs.

If Y1 = 02H then the following “DTS Event” data fields have been identified to be included:

Y2 – Y11 = DTS Event Code (EA101 or EA201 or EA701)

This is an alpha-numeric ASCII code defining the event being reported. The codes are list in the EVA DTS manual. In addition to the standard DTS event codes, an interrogation event is reported as “EA3” and a power outage event is reported as “EA7”.

Y12 – Y15 = Date (EA102)

The date of the event. This data is sent as BCD in the following sequence YYYY/MM/DD. For example, 17 March 2002 would be 20H 02H 03H 17H. If the date is not known these bytes are filled with 99Hs.

Y16 – Y17 = Time (EA103)

The time of the event. This data is sent as BCD in the following sequence HH/MM. For example, 6:30 PM would be 18H 30H. If the time is not known these bytes are filled with 99Hs.

Y18 – Y21 = Duration (EA206)

The duration of the event in total minutes. This data is sent as binary. For example, 4 hours and 15 minutes would be 00H 00H 00H FFH.

Y22 = Activity (EA205)

The current status of the events activity. This field is equal to 00H if the event is inactive (or not reset for “EA3”) or 01H if the event is active (or reset for “EA3”).

Z1 = 05 DTS EVENT ACKNOWLEDGE

The Comms Gateway has recognized that a possible alarm situation has occurred and must act accordingly. The specific actions will be defined by the Comms Gateway operational specifications.

If Y1 = 03H then the following “Asset ID” data fields have been identified to be included:

Y2 = Asset Type

The following code pairs have been defined to represent the type of equipment asset that is being communicated.

Code	Equipment type	DTS header (αα)
01H / 81H	Audit Module / Data Carrier (DC) Identification	AM1
02H / 82H	Bill Validator Identification	BA1
03H / 83H	Changer Identification	CA1
04H / 84H	Control Board Identification	CB1
05H / 85H	Cashless #1 Identification	DA1
06H / 86H	Cashless #2 Identification	DB1
07H / 87H	Machine Identification	ID1

If Y2 has the MSB = 0 (i.e. Y2 = 01H) then the following asset data fields have been identified to be included:

Y3 – Y5 = Manufacturer code (αα101, first 3 characters)

Identification code for the equipment supplier. Sent as ASCII characters. Blanks (20H) are acceptable.

Y6 - Y17 = Serial number (αα101, 4th through 15th characters)

Factory assigned serial number sent as numeric ASCII characters. All bytes must be sent. Zeros (30H) and blanks (20H) are acceptable.

Y18 - Y29 = Model number (αα102)

Manufacturer assigned model number sent as ASCII characters. All bytes must be sent. Zeros (30H) and blanks (20H) are acceptable.

Y30 - Y31 = Software version (or Build Standard) (αα103)

Current software version sent as packed BCD.

If Y2 has the MSB = 1 (i.e. Y2 = 81H) then the following asset data fields have been identified to be included:

Y2 – Y21 = Asset Number (αα105 or αα106)

The asset number of the equipment. This is a reference number used for tracking purposes, separate from the serial number. It is usually programmed by the equipment operator.

If Y1 = 04H then the following “Currency ID” data fields have been identified to be included:

Y2 – Y3 = VMC’s Country / Currency Code (ID402)

The packed BCD Country / Currency code of the VMC can be sent in two different forms depending on the value of the left most BCD digit.

If the left most digit is a 0, the International Telephone Code is used to indicate the country that the changer is set-up for. For example, the USA code is 00 01H (Z2 = 00 and Z3 = 01).

If the left most digit is a 1, the latest version of the ISO 4217 numeric currency code is used. For example, the code for the US dollar is 18 40H (Z2 = 18 and Z3 = 40) and for the Euro is 1978 (Z2 = 19 and Z3 = 78).

All new designs after July, 2000 must use the ISO 4217 numeric currency codes.

Y4 = VMC’s Coin Scaling Factor / Currency Description (ID403)

The multiplier used to scale all monetary values transferred between the VMC and the vending machines monetary system.

Y5 = VMC’s Decimal Point (ID401)

The number of digits to the right of the decimal point. This field is used in countries whose currency requires a number of digits to the right of the decimal point other than 2.

If Y1 = 05H then the following “Product ID” data fields have been identified to be included:

Y2 – Y3 = Item Number

This is the binary field used to link REPORT type 01 to REPORT type 05. This number is defined by the manufacturer.

Y4 – Y9 = Product Number (PA101)

This is the ASCII representation of the Item Number that should be included in the DTS file. All bytes must be sent, leading blanks (20H) are acceptable.

Y10 – Y29 = Product Identification (PA103)

The ASCII product identification that should identify the product itself, as in a name (chips/crisps) or an ID number / bar code. All bytes must be sent, leading blanks (20H) are acceptable.

Y30 = Selection Presence Status (PA107)

This field is set to 00H if a vend mechanism (motor, solenoid, etc.) is present for this selection. This field is set to 01H if a vend mechanism is not present.

An example of a 01H being sent would be if the vend mechanism was present previously, and something occurred so that it is not being currently detected (i.e., removed, broken wire, etc.). It is **not** intended to indicate that a product is not available for vending (i.e., sold out).

VMC Command Code/Sub-code VMC Data Comms Gateway Response

CONTROL 1CH Y1 No data

This command is the vehicle that the VMC uses to control the Comms Gateway's use of an external collection device. For example when it should, or should not, transmit through the external collection device. The information is identified by one of the following subcommands;

Y1 = 00 Disabled

No external transmissions will be granted and no REPORT commands will be sent.

Y1 = 01 Enabled

External transmissions may be requested and REPORT commands will be sent.

Y1 = 02 Transmit

Permission to transmit and / or receive data is granted, or a transmission session is requested. A DATA TRANSMITTED response to a POLL must be sent when the transmission session is complete.

VMC Command	Code/Sub-code	VMC Data	Comms Gateway Response
EXPANSION/ IDENTIFICATION	1FH/00H	Y1	Z1 - Z34

Y1 = 00H IDENTIFICATION subcommand

The VMC is requesting Comms Gateway identification information for asset tracking and optional feature purposes.

Z1 = 06H PERIPHERAL ID

Comms Gateway is sending peripheral ID information. This response includes the following data;

Z2 - Z4 = Manufacturer code

Identification code for the equipment supplier. Sent as ASCII characters. Blanks (20H) are acceptable.

Z5 - Z16 = Serial number

Factory assigned serial number sent as numeric ASCII characters. All bytes must be sent. Zeros (30H) and blanks (20H) are acceptable.

Z17 - Z28 = Model number ASCII.

Manufacturer assigned model number sent as ASCII characters. All bytes must be sent. Zeros (30H) and blanks (20H) are acceptable.

Z29 - Z30 = Software version

Current software version sent as packed BCD.

Z31 - Z34 = Optional Features

Each of the 32 bits indicate an optional features availability. If the bit is set the feature is available. Currently defined options include:

b0: File transport layer support.
 b1: Verbose mode: See REPORT command
 b2 - b31: Future use, must be set to 0.

VMC Command Code/Sub-code VMC Data Comms Gateway Response

EXPANSION/ FEATURE ENABLE	1FH/01H	Y1 - Y5	No data
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Y1 = 01H FEATURE ENABLE subcommand

This command is used to enable each of the optional features defined in Z32-Z35 of the PERIPHERAL ID response. The VMC should send the EXPANSION /IDENTIFICATION command, receive the PERIPHERAL ID response, perform a logical OR with the optional features it wants to enable, and return the resulting enabled features back to the Comms Gateway by setting a bit to 1 for each respective optional feature enabled. All optional features are disabled after reset.

Y2 - Y5 = Optional features enabled

Each of the 32 bits indicates an optional features state. If the bit is set the feature is enabled.

VMC Command Code/Sub-code VMC Data Comms Gateway Response

EXPANSION COMMAND	0FH FAH FTL REQ TO RCV	Y1-Y5	Z1 - Zn (immediate or POLLed)
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The VMC is requesting to receive data from the Comms Gateway whose destination address will always be (18H). Note that all FTL Commands / Responses are defined in Section 2.6.

Y1 = Destination address of command (18H)
 Y2 = Source address of command
 Y3 = File ID
 Y4 = Maximum length
 Y5 = Control

Z1 = 1DH which indicates SEND BLOCK
 Z2 = Destination address of data
 Z3 = Block #
 Z4 - Z34 = Data (maximum of 31 bytes)

or

Z1 = 1CH which indicates RETRY / DENY
 Z2 = Destination address of response
 Z3 = Source address of response (18H)
 Z4 = Retry delay

VMC Command	Code/Sub-code	VMC Data	Comms Gateway Response
EXPANSION COMMAND	0FH FBH FTL RETRY / DENY	Y1-Y3	None

The VMC is retrying, denying, or aborting a data transfer to/from the Comms Gateway whose destination address will always be (18H). Note that all FTL Commands / Responses are defined in Section 2.6.

Y1 =	Destination address of command (18H)
Y2 =	Source address of command
Y3 =	Retry delay

VMC Command	Code/Sub-code	VMC Data	Comms Gateway Response
EXPANSION COMMAND	0FH FCH FTL SEND BLOCK	Y1-Y33	None

The VMC is sending data to the Comms Gateway whose destination address will always be (18H). Note that all FTL Commands / Responses are defined in Section 2.6.

Y1 =	Destination address of command & data (18H)
Y2 =	Block #
Y3 - Y33 =	Data (maximum of 31 bytes)

VMC Command	Code/Sub-code	VMC Data	Comms Gateway Response
EXPANSION COMMAND	0FH FDH FTL OK TO SEND	Y1-Y2	Z1-Z34 (immediate or POLLed)

The VMC is indicating that it is OK for the Comms Gateway to transfer data. The destination address will always be the Comms Gateway (18H). Note that all FTL Commands / Responses are defined in Section 2.6.

Y1 =	Destination address of command (18H)
Y2 =	Source address of command
Z1 =	1DH which indicates SEND BLOCK
Z2 =	Destination address of data
Z3 =	Source address of data
Z4 - Z34 =	Data (maximum of 31 bytes)

VMC Command	Code/Sub-code	VMC Data	Comms Gateway Response
EXPANSION COMMAND	0FH FEH FTL REQ TO SEND	Y1-Y5	Z1 - Zn (immediate or POLLed)

The VMC is requesting to send data to the Comms Gateway whose destination address will always be (18H). Note that all FTL Commands / Responses are defined in Section 2.6.

Y1 =	Destination address of command (18H)
Y2 =	Source address of command
Y3 =	File ID
Y4 =	Maximum length
Y5 =	Control
Z1 =	1EH which indicates OK TO SEND
Z2 =	Destination address of response
Z3 =	Source address of response (18H)
	or
Z1 =	1CH which indicates RETRY / DENY
Z2 =	Destination address of response
Z3 =	Source address of response (18H)
Z4 =	Retry delay

VMC Command	Code/Sub-code	VMC Data	Comms Gateway Response
EXPANSION/ DIAGNOSTICS	1FH/FFH	Y1 - Yn	Z1 - Zn

Y1 = FFH DIAGNOSTICS subcommand

Device manufacturer specific instruction for implementing various manufacturing or test modes.

Y2 - Yn = User defined data

The data portion of this command is defined by the manufacturer and is not part of this document.

Z1 = FFH DIAGNOSTICS

The Comms Gateway is responding to a EXPANSION/DIAGNOSTICS command. This response includes the following data;

Z2 - Zn = User defined data

Device manufacturer specific responses after receiving manufacturing or test instructions. Z1 - Zn implies that any number of bytes may be used for the response data from the Comms Gateway.

8.4 Communications Gateway Non-Response Time

The maximum non-response time for a Comms Gateway is 5 seconds. This is the maximum time for which a Comms Gateway will not respond to a command with ACK, NAK, or a data message.

8.5 Communications Gateway Power Requirements

The current draw for any Comms Gateway must fall within the following limits. All measurements are at the minimum VMC Voltage Output.

Idle mode = 300 mA. (avg.) continuous

Active mode = 1.8 A continuous and up to 2.5 A (max) for an accumulated maximum of 10 seconds. The active power mode must be initiated by the REQUEST TO TRANSMIT followed by the CONTROL/TRANSMIT. The active power mode must be closed by sending the DATA TRANSMITTED. During this time the VMC will make its own decisions about which other peripherals will be disabled or not. This may result in the entire machine being disabled for normal vending.

8.6 Communications Gateway Examples

Event	Exchange
Power on Reset at VMC or JUST RESET received by VMC any other time	Reset sequence Enable sequence
Communications Gateway is triggered to send a file	Request sequence Transmit sequence
VMC is triggered to send a file	Dump sequence Transmit sequence
DTS Event situation occurs at VMC	DTS Event sequence Request sequence Transmit sequence
Error situation is detected at Comms Gateway	Error sequence
Every vend completion	Vend sequence

Reset sequence		
VMC	Comms Gateway	Comments
RESET (18)	→	Reset command
	← ACK	
POLL (1A)	→	Must be sent once reset, internal or external
ACK	← JUST RESET (00)	
SETUP (19...)	→	Establish operation configuration
ACK	← CONFIG. (01...)	
EXPANSION/ID (1F/00...)	→	Send asset information
ACK	← PERIPHERAL ID (06...)	Get asset information
EXPANSION/FEATURE ENABLE (1F/01...)	→	Enable additional feature if necessary
	← ACK	
Enable sequence		
VMC	Comms Gateway	Comments
CONTROL/ENABLE (1C01)	→	Enable command
	← ACK	
Disable sequence		
VMC	Comms Gateway	Comments
CONTROL/DISABLE (1C00)	→	Disable command
	← ACK	

Request sequence		
VMC	Comms Gateway	Comments
File transfer done	using the MDB	file transport layer
Dump sequence		
VMC	Comms Gateway	Comments
File transfer done	using the MDB	file transport layer
<hr/>		
Transmit sequence		
VMC	Comms Gateway	Comments
POLL (1A)	→	
	←	Request to transmit (02)
ACK	→	
CONTROL/ TRANSMIT (1C/02)	→	
	←	ACK
POLL (1A)		
		ACK
		. Continue POLLing until ...
		.
POLL (1A)	→	
	←	Data transmitted (03)
ACK	→	
DTS Event sequence		
VMC	Comms Gateway	Comments
REPORT (1B / 02...)	→	
	←	ACK
		. Repeat until recognized
		.
REPORT (1B /02...)	→	
	←	DTS EVENT ACKNOWLEDGE (05)
Error sequence		
VMC	Comms Gateway	Comments
POLL (1A)	→	
	←	ERROR (06)
ACK	→	Sent continuously, or until the error is resolved
Activity sequence		
VMC	Comms Gateway	Comments
REPORT (1B...)	→	
	←	ACK