



# AN-14 (Line Printer and Easy Print Modes)

December 28, 2005

## AVAILABLE GENERAL QUERIES

The printer can return a lot of information to the host. It can give some status of its current state as well as the current configuration. This is all done through a series of query commands that can be issued to the printer. Not all queries are in all printers, and some queries are available in later versions of printer firmware. All queries are of the same form and contain 6 bytes (0x1b, “{” or 0x7b, TWO LETTER QUERY, “?” or 0x3f, and “}” or 0x7d):

ESC {<TWO LETTER QUERY>?}

Legal two letter queries include:

QUERY	MEANING	ORIGINAL MF2/MF3/2t/4t	RADIO READY 2t/3l/4t	
ESC{BL?}	Bluetooth Configuration			X
ESC{BT?}	Battery Condition	X		X
ESC{CF?}	General Configuration	X		X
ESC{CL?}	Label Related Configuration Values			X
ESC{CV?}	Configuration Version	X		X
ESC{FN?}	Font list – resident and downloaded	X		X
ESC{GR?}	Graphics list – resident and downloaded	X		X
ESC{FM?}	Formats list – resident and downloaded			X
ESC{IR?}	IrDA Configuration (historical in newer printers without IrDA for returning printer type)	X		X
ESC{MD?}	Manufacturing date is returned			X
ESC{MY?}	Memory size and status	X		X
ESC{PH?}	Printhead size	X		X
ESC{SN?}	Serial Number is returned			X
ESC{ST?}	Status – current state of printer	X		X
ESC{TC?}	TCP/IP and 802.11 radio configuration			X
ESC{VR?}	Version – returns all versions	X		X
<b>CARD READER SPECIFIC (2t/4t ONLY)</b>				
		<b>CR<sup>1</sup></b>	<b>SCR<sup>2</sup></b>	<b>SCR<sup>3</sup></b>
ESC{MC?}	Return mag card configuration	X		X
ESC{MR?}	Return data read from magnetic card	X	X	X
ESC{RS?}	Returns card reader status information	X	X	X
ESC{SC?}	Return smart card configuration	X		X

<sup>1</sup> Original card reader on non-radio ready printers is approximately 1 inch thick. .BIN files that support this card reader will have a cr-xyz suffix on the name. The xyz are replaced by “m”, “s”, and “b”, if the Magnetic Card, Smart Card, or Button features are supported. An “x” occupies that position if the feature is not supported. For example, the 2tcr-msx.bin file is for the 2t printer with the original thick card reader that supports the Magnetic and Smart cards. Support for this card reader was last in Version 4.22 firmware.

<sup>2</sup> The newer “Slim Card Reader” or SCR was first supported in Version 4.23 firmware and last supported in the 4t in version 4.33 and the 2t in version 4.34. This card reader is approximately ½ inch thick. The .BIN files that support this card reader have and scr suffix in the name. For example, 2t-scr.bin is for the 2t printer with the slim card reader. All scr .bin files support both the magnetic and smart card readers but do not support the button readers.

<sup>3</sup> The radio ready printers have supported only the “Slim Card Reader” or SCR, beginning with Version 6.52. The .BIN files that support the card reader have an “s” in the suffix. For example, 2tr-s.bin is a radio ready 2t printer that supports the card reader.



Similar to the queries, there are some commands. These have exactly the same form as the queries, but the “?” has been replaced by “!” (0x21)

COMMAND	MEANING	ORIGINAL		RADIO READY
		MF2/MF3/2t/4t		2t/3l/4t
ESC{RE!}	Reset the entire printer RESPONSE: {RE!}	X		X
<b>CARD READER SPECIFIC</b>				
		<b>CR</b>	<b>SCR</b>	<b>SCR</b>
ESC{ME!}	Enable Magnetic Card Reader RESPONSE: {ME!}	X		
ESC{MD!}	Disable Magnetic Card Reader RESPONSE: MD!}	X		
ESC{MZ!}	Zero the Magnetic Card Buffer RESPONSE: {MZ!}	X	X	X
ESC{SP:n}	Turn Smart Card Power ON (n=1) or OFF (n=0)	X	X	X
ESC{RG:n}	Turn Reader Green LED on/off/flash n = 0 → OFF n = 1 → ON n = F → Flashing RESPONSE: {RG!n}	X		
ESC{RR:n}	Turn Reader Red LED on/off/flash n = 0 → OFF n = 1 → ON n = F → Flashing RESPONSE: {RR!n}	X		
ESC{SR:<string>}	Sends <string> to smart card - string is smart card command – returns data returned by card	X	X	X
ESC{SW:<string>}	Sends <string> to smart card – strin includes smart card command and possibly data	X	X	X

The response to each query is similar. It consists of the command repeated, with the “?” replaced by a “!” (0x21). This is followed by a series of parameter and data pairs. Each parameter and data pair are separated by a semicolon “;” (0x3b). Each parameter is one or more letters that uniquely identify that parameter for the type of query. This parameter and data pair is separated by a colon. For example:

Query: ESC{PH?}  
Response: {PH!TD:0384;DD:203;M:M-T102 ;T:24.0C}

This is a response to the printhead query as indicated by the PH!. The first parameter is TD or Total Dots (across printhead) – this printer is 384 dots wide. The next parameter is DD or Dot Density and is shown as 203 dpi. The M parameter is the mechanism type and is an M-T102. And finally the temperature of this printhead is 24.0 degrees Celsius.

In the tables below, the VALUES/FORMAT columns will show valid values that will be returned for each parameter, or the format of the returned values. The meaning of that value, as indicated by the parenthesis below, is for informational purposes only and is NOT returned in the query data. An X in the printer type column indicates that parameter or value is present.



**ESC {BL?} BLUETOOTH CONFIGURATION QUERY**

PARAMETER	MEANING	VALUES/FORMAT	ORIGINAL MF2/MF3/2t/4t	RADIO READY 2t/3t/4t
AD	Bluetooth Address	nn:nn:nn:nn:nn:nn		X
F	Friendly Name	32 chars max		X
SN	Service Name	32 chars max		X
PR	Profile	SPP (fixed)		X
CL	Class	040680 (fixed)		X
D	Discoverable	Y (yes) or N (no)		X
C	Connectable	Y (yes) or N (no)		X
B	Bondable	Y (yes) or N (no)		X
E	Encryption	Y (yes) or N (no)		X
A	Authentication	Y (yes) or N (no)		X
P	Passkey	Y (yes) or N (no) does not ret value		X
I	Inactivity Timeout	nn seconds		X
PWR	Power	ON or OFF		X
W	Watchdog Period	nn seconds		X

**ESC {BT?} BATTERY QUERY**

PARAMETER	MEANING	VALUES/FORMAT	ORIGINAL MF2/MF3/2t/4t	RADIO READY 2t/3t/4t
V or	Voltage of single	n.n volts	X	X
V1 and V2 or	Voltage of each of 2 batteries	n.n volts (for V1) n.n volts (for V2)	X	X
VE	Voltage of batt eliminator	n.n volts	4t only	4t only
T	Temperature of battery	Dep on type ->	nn.nC	Always returns NA
CH	Charge	Y (connected) N (not connected)	X	X
PS	Power Source	A=DC over batt B=Batt over DC C=Batt Eliminator		X (A/B are same in thermal)



**ESC {CF?} CONFIGURATION QUERY**

PARAMETER	MEANING	VALUES/FORMAT	ORIGINAL MF2/MF3/2t/4t	RADIO READY 2t/3l/4t
A	White Space Advance	Y (yes) or N (no)	X	X
B	Baud Rate	012	X (mf2/3)	X
		024	X (all)	X
		048	X (mf2/3)	X
		096	X (all)	X
		192	X (mf2/3)	X
		384	X (all)	X
		576		X
D	Darkness (Burn Adjust)	115		X
		-25%	X	X
		-20%	X	X
		-15%	X	X
		-10%	X	X
		-05%	X	X
		00%	X	X
		05%	X	X
		10%	X	X
		15%	X	X
		20%	X	X
		25%	X	X
		30%	X	X
35%	X	X		
F	Form Feed (act on FF)	Y (yes) or N (no)		X
G	Beep when charger connected	Y (yes) or N (no)	X	X
H	Handshake	B (both)	X	X
		H (hardware)	X	X
		S (software)	X	X
J	EZ Print Job Status Report	Y (yes) or N (no)		X
L	Default Protocol (Note: All emulations are a subset)	ESC (Line Printer)	X	X
		EZ (Easy Print)	X	X
		EMC1 (Custom 1)		X
		EMC2 (Custom 2)		X
		EMC3 (Custom 3)		X
		EMP1 (PGL)		X
		EMZ1 (CPCL)		X
		EMZ2 (Cog)		X
EMZ3 (ZPL)		X		
N	Number of Data Bits	7	X	X
		8	X	X
P	Parity	N (none)	X	X
		E (even)	X	X
		O (odd)	X	X
R	RF Power Timeout	nn (min) / NEVER		X
S	Sound (beeper)	Y (yes) or N (no)	X	X
T	System Timeout (time before going to sleep)	nn (sec) / NEVER	X	X



U	Paper Out Beep	0 = 1 beep Not 0 = 5 beeps 1 – one time 2 – rep every 15s 3 – rep every 30s 4 – rep every 60s		X
TP	Test Print	0 = Normal Not 0 = Special		

**ESC {CL?} LABEL CONFIGURATION QUERY**

PARAMETER	MEANING	VALUES/FORMAT	ORIGINAL MF2/MF3/2t/4t	RADIO READY 2t/3l/4t
T	Type of stock used	P = Plain Paper T = Top QMARK B = Bottom QMARK G = Inter-label Gap		X
D	Distance to advance after QMARK is sensed before stop	Distance given in dotlines (.005 inches)		X
M	Maximum distance to advance if QMARK not sensed	Distance given in dotlines (.005 inches)		X
S	Sensor to use for Paper Out	T = Top Sensor B = Bottom Sensor		LP3 only
P	Presenter	Y = Yes (use) N = No (do not use)		LP3 only
U	Label Under Presenter Timeout	Time in seconds to NOT go to sleep if label is left under presenter sensor		LP3 only
B	Back-up distance	Distance given in dotlines (.005 inches)		X
W	Windows Driver QMARK (automatically advance to find QMARK after print job from Windows Driver)	Y = Yes (assume stock is QMARKED) N = No (assume stock is plain paper)		X



**ESC {CV?} CONFIGURATION VERSION**

PARAMETER	MEANING	VALUES/FORMAT	ORIGINAL MF2/MF3/2t/4t	RADIO READY 2t/3l/4t
T	Upgrade Version Type	Returns string assigned to last upgrade via file fetch (returned ONLY if present)		X

**ESC {FN?} QUERY**

Each font present in the printer will return one complete set of all parameters below

PARAMETER	MEANING	VALUES/FORMAT	ORIGINAL MF2/MF3/2t/4t	RADIO READY 2t/3l/4t
N5	Five character font name	Varies by font	X	X
N1	One character font name	Varies by font	X	X
L	Location	R = Resident D = Download	X	X
UV	User Version (can be assigned by user at time of download)	One character	X	X
UD	User Date (can be assigned by user at download)	Form: XX/YY/ZZ	X	X
US	User Description (can be assigned by user at time of download)	Up to 20 characters	X	X
CPI	Characters per inch	Form: nn.n	X	X

**ESC {GR?} QUERY**

Each graphic present in the printer will return one complete set of all parameters below. If there are no graphics present, the response will be {GR!}

PARAMETER	MEANING	VALUES/FORMAT	ORIGINAL MF2/MF3/2t/4t	RADIO READY 2t/3l/4t
N5	Five character font name	Varies by graphic	X	X
N1	One character font name	Varies by graf joc	X	X
L	Location	R = Resident D = Download	X	X
UV	User Version (can be assigned by user at time of download)	One character	X	X
UD	User Date (can be assigned by user at download)	Form: XX/YY/ZZ	X	X
US	User Description (can be assigned by user at time of download)	Up to 20 characters	X	X
CPI	Characters per inch (provides rough idea of size)	Form: nn.n	X	X



**ESC {FM?} QUERY**

Each format present in the printer will return one complete set of all parameters below. If there are no graphics present, the response will be {FM!}

PARAMETER	MEANING	VALUES/FORMAT	ORIGINAL MF2/MF3/2t/4t	RADIO READY 2t/3l/4t
N5	Five character font name	Varies by format		X
N1	One character font name	Varies by format		X
L	Location	R = Resident D = Download		X
UV	User Version (can be assigned by user at time of download)	One character		X
UD	User Date (can be assigned by user at download)	Form: XX/YY/ZZ		X
US	User Description (can be assigned by user at time of download)	Up to 20 characters		X

**ESC {IR?} INFRARED QUERY**

Even though not all printers have infrared capabilities, the ESC{IR?} query is present in all printers to allow the user to determine uniquely which printer type is attached

PARAMETER	MEANING	VALUES/FORMAT	ORIGINAL MF2/MF3/2t/4t	RADIO READY 2t/3l/4t
P	Protocol	MF2/MF3/2t/4t (non radio) support Infrared  2t/3l/4t (radio ready) do NOT support Infrared	OFF IrDA ASK ASK-CRC DIRECT DIRECT-CRC PULSE PULSE-CRC	Fixed: N (None)
AV	Ask Version	nn (Current 01)	X	
DV	Direct Version	nn (Current 01)	X	Fixed: 00
IV	IrDA Version		n.n-nn	Fixed: 0.00
IN	IrDA Name (unique across printers)	The value returned for this parameter identify the printer type	microFlash2 microFlash3 microFlash4 microFlash4CR 2t 2tCR	Printer Type 2tR 3LR 4tr Card Reader Add S suffix Radio Add 802 or Add BT suffix
ID	IrDA Nickname		X	X



**ESC {MD?} QUERY**

The manufacturing date of the printer is returned, IF the manufacturing date has been written to the printer, otherwise the data field returned is None. Since the manufacturing date is actually the parameter returned, there is no need for the Parameter:Data after the MD! in the response (MD!<date string>. The date is a string that can be entered in any format. Typically, the format is MM/DD/YY.

Query:  
ESC{MD?}

Response (note that the date string can have different formats):  
{MD!12/10/2005}

**ESC {MY?} MEMORY QUERY**

PARAMETER	MEANING	VALUES/FORMAT	ORIGINAL MF2/MF3/2t/4t	RADIO READY 2t/3l/4t
FS	Flash Size	In MegaBits	X	X
FM	Flash Type	String (AMD)	X	X
RS	RAM Size	In MegaBits	X	X
DT	Download Total	Total memory available for download (Bytes)	X	X
DR	Download Remaining	Memory remaining from total for additional download (Bytes)	X	X

**ESC {PH?} PRINTHEAD QUERY**

PARAMETER	MEANING	VALUES/FORMAT	ORIGINAL MF2/MF3/2t/4t	RADIO READY 2t/3l/4t
TD	Total number of dots across printhead	0384 = 2" printer 0576 = 3" printer 0834 = 4" printer	X	X
DD	Dot Density	Approx 203 dpi (8 dots per mm)	X	X
M	Model	M-T102 RKF2003 LTP3345 LTP3445	X X X	X X X
T	Temperature	nn.nC	X	X

**ESC {SN?} SERIAL NUMBER QUERY**

The serial number of the printer is returned, IF the serial number has been written to the printer, otherwise the data field returned is None. Since the serial number is actually the parameter returned, there is no need for the Parameter:Data after the SN! in the response (SN!<serial number string>. The serial number is a string that can be entered in any format. Typically, it is the serial number printed on the label on the printer.

Query:  
ESC{SN?}

Response (note that the serial number string can have different formats):  
{SN!MH00035}





**ESC {ST?} STATUS QUERY**

PARAMETER	MEANING	VALUES/FORMAT	ORIGINAL MF2/MF3/2t/4t	RADIO READY 2t/3l/4t
E	Error	N – None c - Command d – Data g – Global Parm n – Name p - Protocol s – Syntax x – PCX file	X	Fixed as “N”
S	Printer Status	C - Complete I – Idle K - Killed P – Paper T - Timeout	X	X
L	Head Lever UP or DOWN	D – Down U - UP	X	X
P	Paper	N – No Paper P – Paper present	X	X
J	Jam	(Impact Printers)		
R	Remaining RAM	Unused RAM	X	X
B	Battery Temperature and Voltage status	O – All OK T – Temp error V – Voltage error	X	O/V only

**ESC {TC?} TCP/IP QUERY**

PARAMETER	MEANING	VALUES/FORMAT	ORIGINAL MF2/MF3/2t/4t	RADIO READY 2t/3l/4t
E	ESSID	32 Bytes max		X
N	Station Name	64 Bytes max		X
T	Type	H = Ad Hoc P = Access Point		X
D	DHCP/BOOTP	Y = Use DHCP B = Use BOOTP N = Use static IP R = Requesting IP F – Request failed		X
I	IP Address	nnn.nnn.nnn.nnn		X
M	Subnet mask	nnn.nnn.nnn.nnn		X
G	Gateway	nnn.nnn.nnn.nnn		X
P	Port used to print	nnnn		X
NA	Network Authentication	0 = None 1 = LEAP (Cisco) 2 = WPA-PSK (Symbol) 3 = WPA (future – Symbol)		X
S	Authentication Algorithm	0 = Open 5 = 40 bit 13 = 128 bit		X



W	Enable Encryption	1 = WEP encryption 2 = Allow unencrypted		X
K	Key to use	1-4 for key 1-4		X
K1	Key #1	0 = No Key Present 5 = 40 bit key present 13 = 128 bit key pres		X
K2	Key #2	0 = No Key Present 5 = 40 bit key present 13 = 128 bit key pres		X
K3	Key #3	0 = No Key Present 5 = 40 bit key present 13 = 128 bit key pres		X
K4	Key #4	0 = No Key Present 5 = 40 bit key present 13 = 128 bit key pres		X
MAC	MAC address of card	nn-nn-nn-nn-nn		X
802/11B Info	Information about 802.11b card in printer	Card type, card firmware version		X
P2	Power Saving Mode (CAM ON or OFF)	Y = CAM Off N = CAM On		X
PWR	Card power (Read Only)	ON or OFF		X
Q	Signal Quality Indicator	Y = ON N = OFF		X

**ESC {VR?} VERSION QUERY**

PARAMETER	MEANING	VALUES/FORMAT	ORIGINAL MF2/MF3/2t/4t	RADIO READY 2t/3i/4t
F	Firmware Version	n.nn	X	X
C	Comm Controller Version	n.nn		X
B	Boot Version	n.nn	X	X
D	Download Version	n.n	X	X
H	Hardware Controller Version	n.nn		X



### CARD READER SPECIFIC

#### ESC {MC?} MAGNETIC CARD CONFIGURATION

PARAMETER	MEANING	VALUES/FORMAT	ORIGINAL 2t/4t		RADIO READY 2t/4t
			CR <sup>1</sup>	SCR <sup>2</sup>	SCR <sup>3</sup>
EN	Enabled (e.g. ON or OFF)	ON = Enabled OFF = Disabled	X		ON (fixed)
DIR	Direction card is read	INS = On Insertion WITH = on Withdrawl	X		WITH (fixed)
T1	Track #1 Enabled	ON = Enabled OFF = Disabled	X		X
T2	Track #2 Enabled	ON = Enabled OFF = Disabled	X		X
T3	Track #3 Enabled	ON = Enabled OFF = Disabled	X		X

#### ESC {MR?} MAGNETIC CARD READ DATA

PARAMETER	MEANING	VALUES/FORMAT	ORIGINAL 2t/4t		RADIO READY 2t/4t
			CR <sup>1</sup>	SCR <sup>2</sup>	SCR <sup>3</sup>
{N} (Complete response)	No data has been read	N/A	X	X	X
T1	Track #1	B = Bad Data Read N = No Data Read Otherwise Returns data read including sentinels	X	X	X
T2	Track #2	B = Bad Data Read N = No Data Read Otherwise Returns data read including sentinels	X	X	X
T3	Track #3	B = Bad Data Read N = No Data Read Otherwise Returns data read including sentinels	X	X	X



**ESC {RS?} READER STATUS**

PARAMETER	MEANING	VALUES/FORMAT	ORIGINAL 2t/4t		RADIO READY 2t/4t
			CR <sup>1</sup>	SCR <sup>2</sup>	SCR <sup>3</sup>
{N} (Complete Response)	Card Reader not responding	N/A		X	X
{N/A} (Complete Response)	Software loaded does not support Card Reader	N/A			X
P:n	Smart Card Power	n = 0 → SC Pwr OFF n = 1 → SC Pwr ON	X	X	X
S:n	Card Seated in slot	n = 0 → No Card n = 1 → Card Present	X	X	X
B:n (Button Readers Only)	Button Attached	n = 0 → No Button n = 1 → Button Present	X		
G:n	Green LED status	n = 0 → Green LED Off n = 1 → Green LED On n = F → Green LED Flash	X	0 (fixed)	0 (fixed)
R:n	Red LED status	n = 0 → Red LED Off n = 1 → Red LED On n = F → Red LED Flash	X	0 (fixed)	0 (fixed)

**ESC {SC?} SMART CARD CONFIGURATION**

PARAMETER	MEANING	VALUES/FORMAT	ORIGINAL 2t/4t		RADIO READY 2t/4t
			CR <sup>1</sup>	SCR <sup>2</sup>	SCR <sup>3</sup>
EN	Enabled (e.g. ON or OFF)	ON = Enabled OFF = Disabled	X		ON (fixed)
ST	Smart Card Type	SYNC = Synchronous ASYNC = Asynch	X		
SP	Smart Card Protocol	T = 0 or T = 1	X		X
C	Command Format	BIN = Binary or ASCII HEX	X		X
R	Response Format	BIN = Binary or ASCII HEX	X		X