

## Table of Contents

<b>1.</b>	<b>SPECIFICATIONS .....</b>	<b>2</b>
<b>2.</b>	<b>INSTALLATION .....</b>	<b>4</b>
2.1.	Introduction .....	4
2.2.	Important .....	4
2.3.	Power Connection .....	5
2.4.	Communication connections .....	5
2.4.1.	Earthing Requirements for Cable Shields .....	5
2.4.2.	Serial Connection .....	5
2.5.	Setup Command .....	6
2.6.	Mounting Options .....	9
2.6.1.	Wall Mounting .....	9
2.6.2.	Weather Hood (Optional) .....	10
2.6.3.	Optional Mounting Plate .....	10
<b>3.</b>	<b>ERROR MESSAGES .....</b>	<b>11</b>
<b>4.</b>	<b>APPENDIX A : SUPPORTED PROTOCOLS .....</b>	<b>12</b>
<b>5.</b>	<b>APPENDIX B: ASCII CODES .....</b>	<b>13</b>

# 1. Specifications

Display	
Display	D732 – Six (6) LED digits with decimal points for displaying numeric, semi-alpha characters at 120 degrees viewing angle. <ul style="list-style-type: none"> <li>• Character size (H x W) – 75mmx40mm (3"x1.6")</li> <li>• 28 LEDs per digit</li> <li>• 35mm (1.4") round RED and GREEN traffic lights</li> </ul>
Performance	
Visibility	Greater than 20m (66 feet) at 120 degrees viewing angle
Update Rate	Dependant on data update rate
Operating Environment	Temperature: –10 to +50°C, -14 to 122°F case temperature Humidity:<90%RH non-condensing Storage: –20 to +60°C, -4 to 140°F ambient
Digital	
Setup	Automatic detection with adjustment via a command string
Memory	Full non-volatile operation
Dimensions	
External Dimensions L x H x D	485mmx150mmx80mm (19.1"x5.9"x3.2")
Display Window L x H	380mmx80mm (15.0"x3.2")
Weight	3.5kg (7.7lb)
Power	
AC Power	110-240VAC 50/60Hz 23W MAX
Features	
Serial Inputs	RS-232 – two wire, receive only RS-485 – two wire, receive only
Baud Rate	Fixed 9600 baud, 8 Data Bits, No Parity and 1 Stop bit
Unit Addressing	Up to 100 addresses supported (00-99)
Display Timeout	5 seconds on data loss (default), adjustable
Traffic lights	Controlled by supported protocols. Red and Green
Decimal Point	Displayed between digits as a single LED. The decimal point does not affect number of digits displayed.
Brightness Control	Adjustable 10 steps and Auto Detect. Full Brightness Default
Approvals	FCC, CE, C-tick

NTEP Multi Zero support	Multi zero support only applies to supported indicators and protocols. If the division size is 1x or higher, when the weight display returns to Zero the D732 will also display the trailing zero. Example: With the count set to 20, an indicator displays 00 at zero load. The D732 will also show 00 at zero as there is no leading zero blanking. NTEP is the National Type Evaluation Program in the US.
<b>Optional Accessories</b>	
	Weather Hood
	Pole mounting plate (RAM and VESA mounting compatible)

## 2. Installation

### 2.1. Introduction

The D732 is a 7 segment super bright LED remote with 75mm (3") high digits and traffic lights. The D732 remote display is capable of interpreting and displaying formatted weight transmissions from digital weight indicators. Additionally it can be used to display semi-alpha text. The D732 can display up to 6 semi-alpha/numeric digits in 7 segment format.

This unit is suitable for use in external applications and is designed to an IP65 rating. An optional weather hood is available to minimise effects of direct sunlight. The unit can be mounted on a flat surface with standard brackets or fixed to a pole using the optional mounting plate. The mounting plate also supports RAM and VESA mounting brackets.

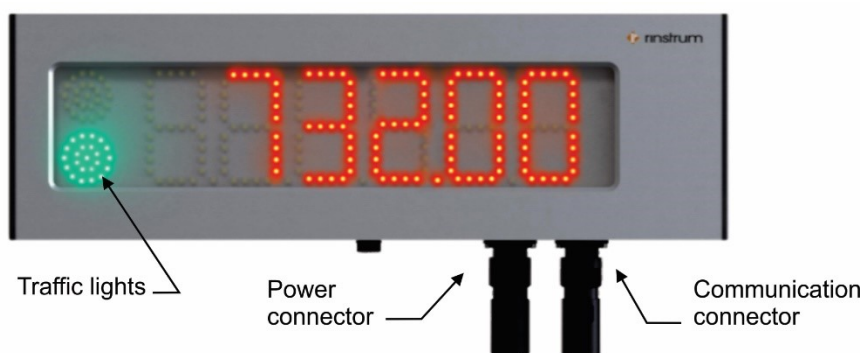


Figure 1 - D732 remote display

### 2.2. Important

The D732 remote display unit contains precision electronics and must not be subjected to shock, excessive vibration, or extremes of temperature, either before or after installation.

The serial and power inputs of the display are protected against electrical interference; however excessive levels of electro-magnetic interference may affect the operation of the instrument. The remote display unit should be installed away from any sources of electrical noise and the power and data cables should run separately from other sources of electrical interference.

The housing is rated to IP65 with a breather valve located on the underside of the extrusion to prevent condensation build up. This area should not be subject to high pressure water or other fluids else internal damage may occur.

There are no user serviceable parts inside. **Warranty will be void if the housing is opened or either of the seals are broken.** All connections are made at the external sockets located on the bottom, right hand side. Ensure power cable is not connected to a live source before terminating the power connector. Make sure the environment is dry when terminating to prevent moisture ingress into sealed connectors.



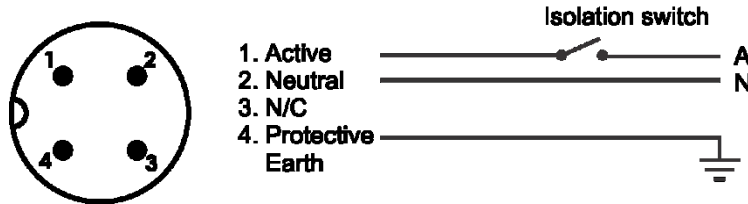
**Disconnect  
power before  
opening cable  
connector**

### 2.3. Power Connection

Use an AC power source of 110-240VAC. The *Protective Earth* pin 4 MUST be connected to AC mains earth for both safety and EMC regulation compliance.

**Note:** The power connection should be performed in accordance with local regulations.

#### AC Power Connection



Use a power cable of min 0.75mm<sup>2</sup> (AWG 20) to max 2.5mm<sup>2</sup> (AWG 14)

Figure 2 - AC power supply socket connection

### 2.4. Communication connections

#### 2.4.1. Earthing Requirements for Cable Shields

Cable shields should ideally be connected to earth at one end for the communications option below. As there is no provision for the shield connection at the communications connection end of the display, it is recommended the shield be terminated at the indicator (source) end.

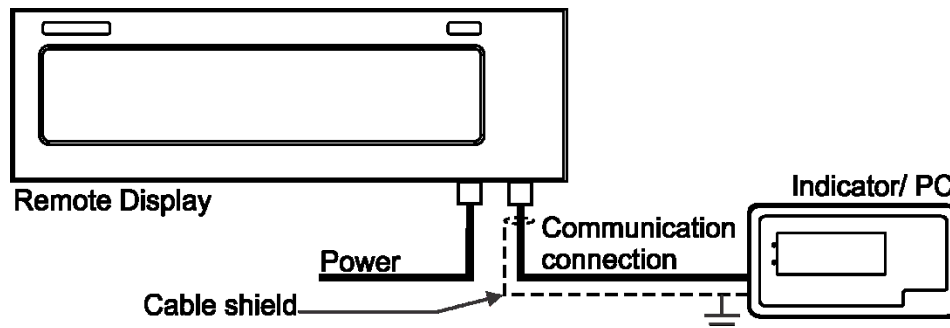


Figure 3 - Shield Earthing

#### 2.4.2. Serial Connection

The serial connection is used to transmit data to the remote display. The serial connection settings are fixed (Baud rate - 9600, 8 data bits, no parity and 1 stop bit).

A shielded data cable should be used to prevent electrical noise interfering with the operation of the unit.

#### Communications Connection (Serial)

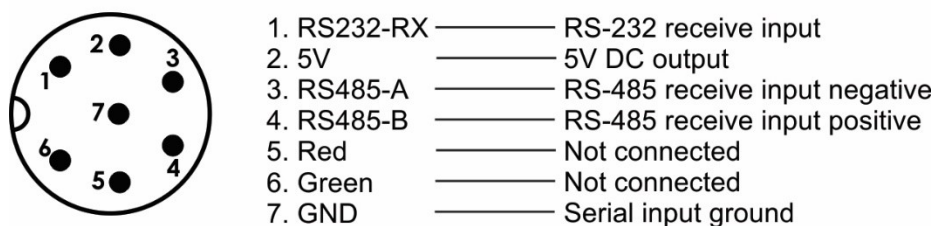


Figure 4 - Serial socket connections

**Note** - GND pin (7) is serial input ground, NOT shield or power ground.

### ◆ RS-232 Receive Only

RS232 is not recommended for long cable runs or electrically noisy environments.

#### Communications Connection (Serial)

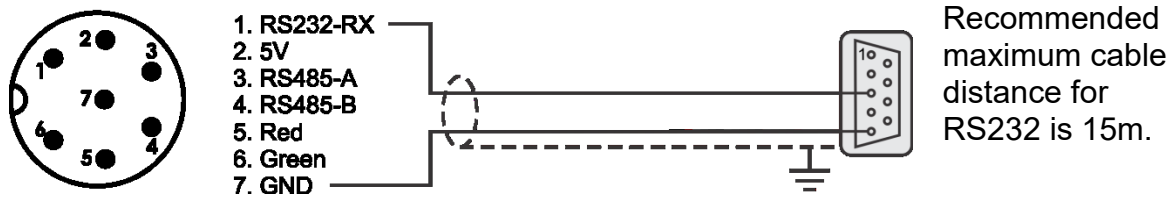


Figure 5 - RS232 Socket connection

### ◆ RS-485 Receive Only

RS485 is the preferred serial connection for long cable runs. Multi-dropping is supported. A 120Ω resistor is provided for termination.

#### Communications Connection (Serial)

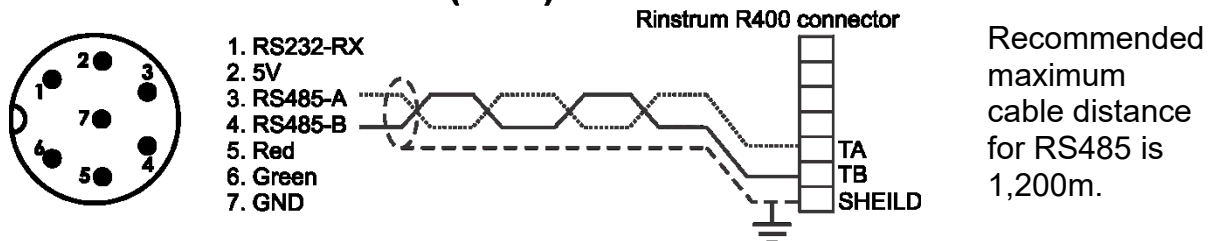


Figure 6 - RS485 Socket connection

## 2.5. Setup Command

The display will auto-detect the Protocol on start-up when the string is being streamed to it. The display will try and display all data received when in a locked state even if the protocol does not match. Check the start-up sequence if the remote is locked to the correct protocol (PR. 00 is auto). There is a list of settings that are configurable if the default values are not suitable. The reset string will default the unit and must be used prior to making changes. These settings can be altered with a setup command string which is required to be streamed to the display instead of the source device protocol prior to installation.

### Reset String:

Character Number	0	1
Description	BEL	SOH

Function	Description
BEL	<b>0x07</b> = Control Character BEL
SOH	<b>0x01</b> = Control Character SOH - Start of Header

### Configuration String:

Character Number	0	1	2	3	4	5	6	7	8	9	10
Description	STX	Annunciator position	Address Hi	Address Lo	Time Out Hi	Time Out Lo	Brightness	Save Settings	Protocol Hi	Protocol Lo	SPC
Character Number	11	12	13	14	15	16	17	18	19	20	
Description	SPC	SPC	SPC	SPC	SPC	SPC	SPC	SPC	SPC	ETX	

Function	Description
STX	<b>0x02</b> = Start of Transmission
Annunciator position	<b>0x30</b> - Left hand annunciators <b>0x31</b> - Right hand annunciators <b>0x32</b> - Left hand with units <b>0x33</b> - Right hand with units Not supported leave as 0x30
Address Hi	MSB of the address value Default: <b>0x30</b> <b>0 to 9 (0x30 to 0x39)</b>
Address Lo	LSB of the address value Default: <b>0x31</b> <b>0 to 9 (0x30 to 0x39)</b>
Time Out Hi	MSB of the Time out value, in seconds Default: <b>0x30</b> <b>0 to 9 (0x30 to 0x39)</b>
Time Out Lo	LSB of the Time out value, in seconds Default: <b>0x35</b> <b>0 to 9 (0x30 to 0x39)</b>

Brightness	Brightness value <b>0x30</b> = MAX to <b>0x39</b> = MIN <b>0x3A</b> = Auto Detect	Default: <b>0x30</b>
Save	<b>0x56</b> = Save modified settings	
Protocol Hi	MSB of the Protocol value <b>0</b> to <b>9</b> ( <b>0x30</b> to <b>0x39</b> )	Not supported leave as 0x30
Protocol Lo	LSB of the Protocol value <b>0</b> to <b>9</b> ( <b>0x30</b> to <b>0x39</b> )	Not supported leave as 0x30
SPC	<b>0x20</b> = Space	
ETX	<b>0x03</b> = End of Transmission	

### Sending the Setup Command

#### ◆ Rinstrum Remote Display Configurator

Use the *Rinstrum Remote Display Configurator* software to configure the remotes. The software Versions 1.01 and higher are applicable to the string structure described here. The settable options are laid out in check boxes or drop down menus with simple instructions shown.

#### ◆ Alternative Methods

The **Configuration String** can be streamed from a PC running terminal software such as "RealTerm", Android App "Slick USB" or similar. Alternatively you can use the custom string format in the Rinstrum R400 series indicators to send the string (this method cannot currently be used for displays with Ethernet option).

Process:

- Remove power from the remote.
- Connect a suitable serial cable from the input of the display to your PC, tablet or R400 indicator and apply power.
- If the remote has not received and displayed a valid protocol prior to been reset from custom settings then you will have send a supported protocol first to acknowledge the previous changes.
- Send the **Reset String** via the software or R400 indicator until.
- Display will show **—OK—** then reinitialize at default settings (Note: if unit already at default settings then the **—OK—** message will not be shown)
- Determine what settings need to be changed as based on the **Configuration String**. Set the suitable options in the software or create your custom one with the connected R400.
- Send the **Configuration String** out to the display until **Proto 40** then **—OK—** is shown, (at least 6 times at 1 sec intervals best).
- The remote will now reinitialize with the new settings as shown in the start-up sequence.
- Disconnect power to the remote.
- If required disconnect the setup cable and reconnect the primary system device.



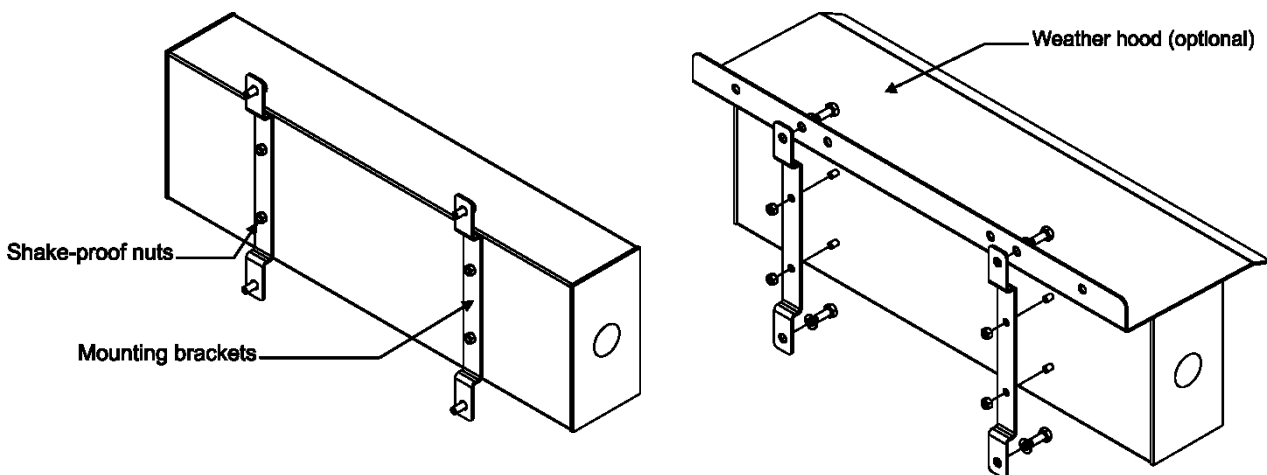
- Apply power to remote.
- Unit is ready for operation with the new configuration settings.

**Examples:** using RealTerm

- To change the Unit Address from the default value 01 to 35:  
\\0x02\\0x30\\0x33\\0x35\\0x30\\0x35\\0x30\\0x56\\0x30\\0x30\\0x20\\0x20\\0x20\\0x20\\0x20\\0x20\\0x20\\0x03
- To change the Time-Out value to 0 seconds (thus disabling):  
\\0x02\\0x30\\0x30\\0x31\\0x30\\0x30\\0x30\\0x56\\0x30\\0x30\\0x20\\0x20\\0x20\\0x20\\0x20\\0x20\\0x20\\0x03

## 2.6. Mounting Options

Two stainless steel mounting brackets are used to mount the unit on a flat surface. These brackets are bolted to rear of the housing using the shake-proof nuts provided. The outer mounting holes are 8mm in diameter.



**Figure 7 - Mounting brackets and optional weather hood**

### 2.6.1. Wall Mounting

For wall mounting it is recommended that:

- 6mm or 1/4" bolts and washers be used as a minimum.
- Both Brackets are to be used with mounting hole centres at 250mm (9.8") wide and 200mm (7.9") high. Fit top bolts first to support display the fit the top bolts to ease installation.

### 2.6.2. Weather Hood (Optional)

The optional weather hood can be used to minimise effects of direct sunlight. The Weather Hood mounting holes line up with the wall mounting holes on the brackets for easy fitment.

**Note:** It is recommended when fitting the optional weather hood the two bottom bolts are loosely installed first to support the remote.

### 2.6.3. Optional Mounting Plate

The optional mounting plate supports VESA, RAM and pole mounting.

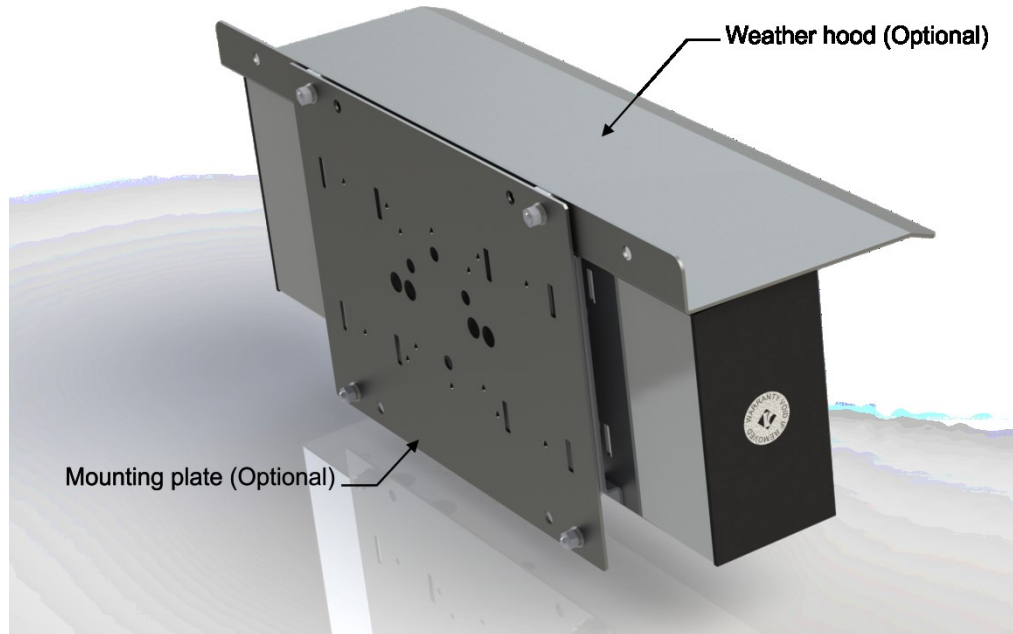


Figure 8 - Optional mounting plate

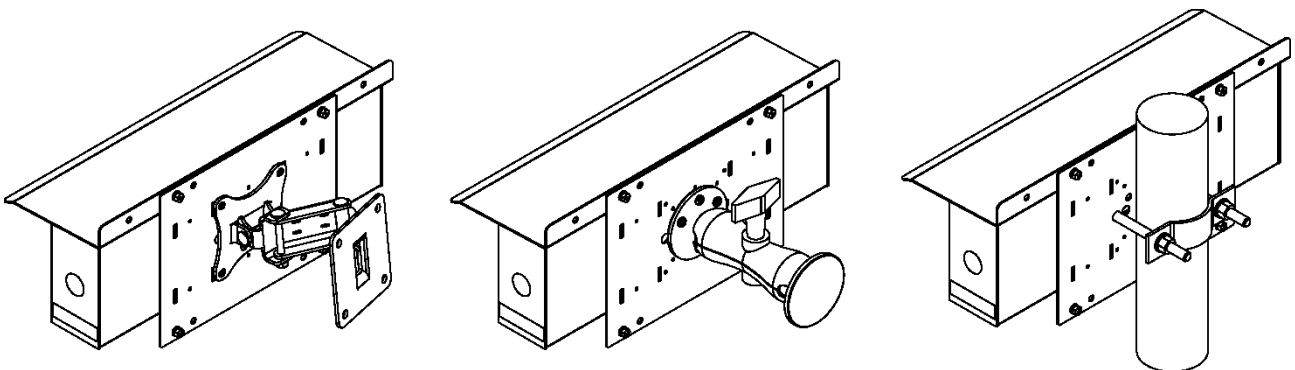


Figure 9 - VESA, RAM and Pole mounting examples

### **3. Error Messages**

Error	Description
--U--	Underweight - the weight is below the minimum allowable weight reading. Check source device.
--O--	Overweight - The weight is above the maximum allowable weight reading. Check source device.
--E--	Error - The source device is reporting an error in it status as detected in the protocol. Check source device.
--/--	No valid data from indicator and unit has timed out. Check serial input, protocol/ baud/data-bits are supported then power cycle remote to reset.

## 4. Appendix A : Supported Protocols

On power up the display will attempt to automatically detect one of the following protocols. Note that compatibility is not guaranteed and manufacturers may change their protocol at any time without notice.

Protocol	Name	Serial Traffic light support	NTEP multi zero support	Protocol commonly used by indicators from:
1	Ranger A	Yes	Yes	Rinstrum, GSE, HBM & PT
2	Ranger C	Yes	Yes	Rinstrum GSE, HBM & PT
4	Ranger D	Yes	Yes	Rinstrum
5	PCMODE	Yes	No	Custom software
24	Condec	No	Yes	UMC, GSE, Rice Lake, Cardinal, Fairbanks, Eaton, Transcell

Refer **Remote Display Protocol Manual** for detailed protocol descriptions.

## 5. Appendix B: ASCII codes

Code	Char	Code	Ch	Code	Ch	Code	Ch	Code	Ch
000 (^)	NULL	026 (0x1A)	SUB	052 (0x34)	'4'	078 (0x4E)	'N'	104 (0x68)	'h'
001 (0x01)	SOH	027 (0x1B)	ESC	053 (0x35)	'5'	079 (0x4F)	'O'	105 (0x69)	'i'
002 (0x02)	STX	028 (0x1C)	FS	054 (0x36)	'6'	080 (0x50)	'P'	106 (0x6A)	'j'
003 (0x03)	ETX	029 (0x1D)	GS	055 (0x37)	'7'	081 (0x51)	'Q'	107 (0x6B)	'k'
004 (0x04)	EOT	030 (0x1E)	RS	056 (0x38)	'8'	082 (0x52)	'R'	108 (0x6C)	'l'
005 (0x05)	ENQ	031 (0x1F)	US	057 (0x39)	'9'	083 (0x53)	'S'	109 (0x6D)	'm'
006 (0x06)	ACK	032 (0x20)	' '	058 (0x3A)	':'	084 (0x54)	'T'	110 (0x6E)	'n'
007 (0x07)	BEL	033 (0x21)	!'	059 (0x3B)	','	085 (0x55)	'U'	111 (0x6F)	'o'
008 (0x08)	BS	034 (0x22)	""	060 (0x3C)	'<'	086 (0x56)	'V'	112 (0x70)	'p'
009 (0x09)	HT	035 (0x23)	'#'	061 (0x3D)	'='	087 (0x57)	'W'	113 (0x71)	'q'
010 (0x0A)	LF	036 (0x24)	'\$'	062 (0x3E)	'>'	088 (0x58)	'X'	114 (0x72)	'r'
011 (0x0B)	VT	037 (0x25)	'%'	063 (0x3F)	'?'	089 (0x59)	'Y'	115 (0x73)	's'
012 (0x0C)	FF	038 (0x26)	'&'	064 (0x40)	'@'	090 (0x5A)	'Z'	116 (0x74)	't'
013 (0x0D)	CR	039 (0x27)	'''	065 (0x41)	'A'	091 (0x5B)	'['	117 (0x75)	'u'
014 (0x0E)	SO	040 (0x28)	'('	066 (0x42)	'B'	092 (0x5C)	'\"	118 (0x76)	'v'
015 (0x0F)	SI	041 (0x29)	')'	067 (0x43)	'C'	093 (0x5D)	']'	119 (0x77)	'w'
016 (0x10)	DLE	042 (0x2A)	'*'	068 (0x44)	'D'	094 (0x5E)	'^'	120 (0x78)	'x'
017 (0x11)	DC1	043 (0x2B)	'+'	069 (0x45)	'E'	095 (0x5F)	'_'	121 (0x79)	'y'
018 (0x12)	DC2	044 (0x2C)	'.'	070 (0x46)	'F'	096 (0x60)	''	122 (0x7A)	'z'
019 (0x13)	DC3	045 (0x2D)	'-'	071 (0x47)	'G'	097 (0x61)	'a'	123 (0x7B)	'{'
020 (0x14)	DC4	046 (0x2E)	':'	072 (0x48)	'H'	098 (0x62)	'b'	124 (0x7C)	' '
021 (0x15)	NAK	047 (0x2F)	'/'	073 (0x49)	'I'	099 (0x63)	'c'	125 (0x7D)	'}'
022 (0x16)	SYN	048 (0x30)	'0'	074 (0x4A)	'J'	100 (0x64)	'd'	126 (0x7E)	'~'
023 (0x17)	ETB	049 (0x31)	'1'	075 (0x4B)	'K'	101 (0x65)	'e'	127 (0x7F)	DEL
024 (0x18)	CAN	050 (0x32)	'2'	076 (0x4C)	'L'	102 (0x66)	'f'		
025 (0x19)	EM	051 (0x33)	'3'	077 (0x4D)	'M'	103 (0x67)	'g'		

**Note:** Any reference to third party software or apps is based on tested use only as no commercial agreements in place.