GLOBAL INKJET SYSTEMS

GIS User Guide

Print Server Communication 2.0

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Safety

Information alert that can prevent possible damage to the user, product or other objects

Information caution that can avoid possible damage to the user, product or other objects

Information

Notes provide added information for the user

Recommendations indicate advised procedures or maintenance in order to maximise product functionality and lifespan

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1 Introduction

The purpose of this manual is to provide information on the TCP/IP Command set that can be used to control the Print Server 2 to affect different print operations.

This manual does not cover the functionality of the Print Server 2 (such as configuration management). For further information, please consult the Print Server User Guide 2.0.

2 Print Server

2.1 Connecting to Print Server

The client must connect to Print Server 2 through a TCP/IP socket. The network address to use is the IP address of the computer Print Server 2 is on (or 'localhost' if it is on the same computer). The network port is defined by the command line arguments passed to the GIS Print Server 2.exe file, or 2000 by default if no command line arguments are passed. For more information on the command line arguments, please consult the *Print Server User Guide 2.0*.

2.2 Connecting Best Practice

GIS recommends setting up two TCP/IP clients - one for Printing commands and the second for Abort commands

It is important to open a new TCP/IP socket and send the Abort Print Command (**P,A**) on this new socket connection if you want to abort mid-print

By default, Print Server launches using ports 2000 and 2100 but when launching Print Server from the command line or by using the Print Server Monitor tool, the port numbers can be manually selected.

Note that Print Server may fail to open or function correctly if another process or application is using a port number that is 5000 greater than that being used by Print Server. E.g., if Print Server is using ports 2000 and 2100, then ensure that no other process or application is using port 7000 and 7100

2.3 Initialisation

The client can initialise Print Server 2 and all engines explicitly, but this is not necessary if Print Server 2 is set to auto configure - set through the control on the Print Server 2 interface, as shown in Figure 3.1. For more information on auto configuration, please consult the *Print Server User Guide 2.0*.

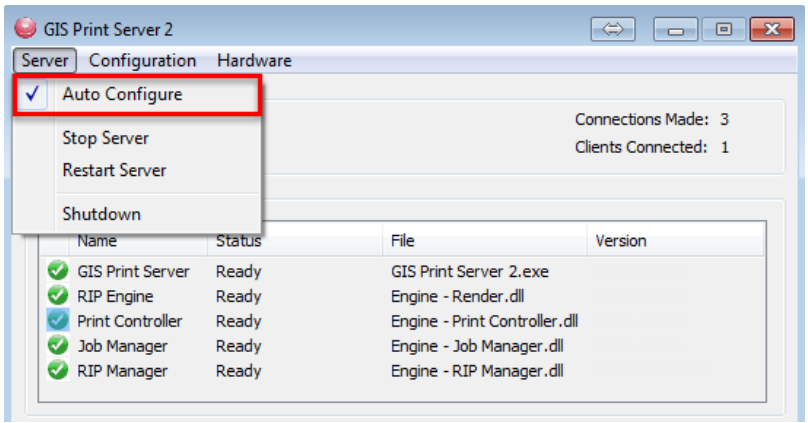

Figure 3-1: The Print Server auto configuration setting

2.4 Job Manager

Print Server 2 can contain a Job Manager engine component, responsible for queuing and starting render & print jobs (for more information, please consult the *Print Server User Guide 2.0*). When implementing a client to perform render & print operations, GIS recommends that the Job Manager is not used (if it is present), as the queuing and starting operations will be more effectively performed in the client. Any commands related to the Job Manager are therefore omitted from this document.

3 Communication Protocol

3.1 Command Sequence

The typical interaction of the commands between the client and the Print Server 2 is described in **Figure 4.1**.

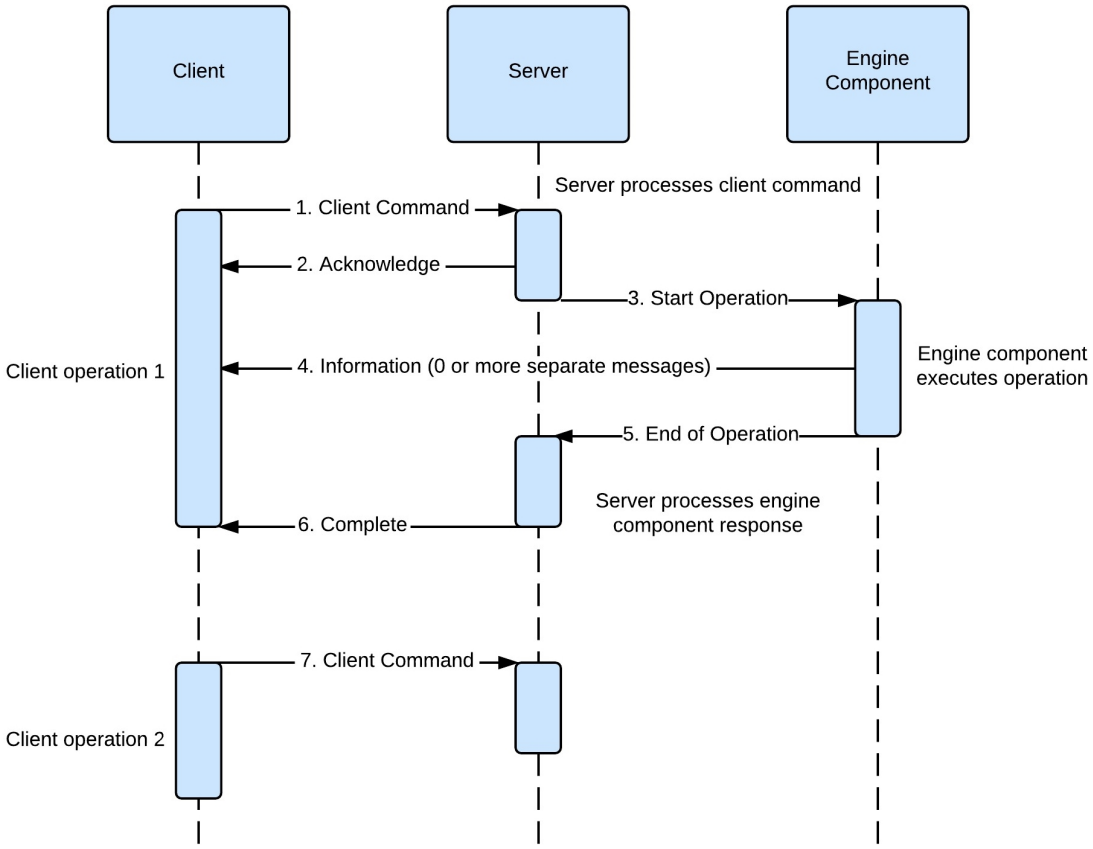

Figure 4-1: The typical command sequence

Message	Description	Action
1	Client Command	The client sends the command to the server
2	Acknowledge	An acknowledgement that the server has received the command
3	Start Engine Operation	The start of the appropriate engine operation for the command received
4	Information	A variable (0 or more) number of information messages that describe the status of the current operation
5	End of Engine Operation	The engine operation returns when it has finished
6	Complete	The message informing the client that the operation has completed

Message	Description	Action
7	Next Client Command	The next client command can start once the complete message for the previous command has been received

There are some commands which do not follow this standard sequence, and this will be highlighted where appropriate.

3.2 Messages

Every message that is sent between the client and the Print Server 2 takes the form of a comma separated line of text.

It is vital that the new line character ('\n' in C++, 'vbNewLine' in VB) is added to the end of every message sent to the Print Server 2, as the Print Server 2 uses this character as the delimiter between incoming messages

For optimisation purposes, two or more messages can be sent to the Print Server 2 in a single message i.e. as a single line of text. The commands must be still separated by new line character ('\n' in C++, 'vbNewLine' in VB)

The TCP/IP communication may group a number of messages from the Print Server 2 into a single TCP/IP response. It is therefore vital that the responses are split up by the new line character ('\n' in C++, 'vbNewLine' in VB) to ensure no messages are lost

3.2.1 Connection Messages

The messages sent between the client and server when the client is trying to connect to the server use the format shown in Table 4-1.

N,<Connection Stage Code>,<Variables>

Table 4-1: The connection message format

Section	Description	Action
<Engine Code>	The Connection Code	The code indicating that this is a connection message
<Connection Stage Code>	The Stage of the Connection	The code of the current stage of the connection (see section Connection Stage Codes on page 14)
<Variables>	Variables associated with the connection stage	The text representations of the variables for the connection stage, separated by commas

3.2.2 Client Command Messages

The messages used to initiate an operation in the server (message 1 in Figure 4.1) use the format shown in Table 4-2.

<Engine Code>,<Operation Code>,<Variables>

Table 4-2: The client command message format.

Section	Description	Action
<Engine Code>	The Engine Code	The code indicating which engine component this command is going to. This can be: • S - The Print Server • R - The Render Engine • P - The Print Controller • M - The Print Server Monitor
<Operation Code>	The Operation To Be Performed	The code of the operation to be performed (see Client Command Message Operation Codes on page 15). This identifier may be further broken up into comma separated text
<Variables>	Start Engine Operation	The text representations of the variables for the operation, separated by commas

Client command messages for an engine component can only be sent when the engine component is not currently executing an operation. If it is busy, a complete command containing the busy error code for this engine component (see Complete Message Error Codes on page 42 for the actual value) will be returned immediately.

3.2.3 Acknowledge Messages

The messages sent by the Print Server 2 to acknowledge a client command message use the format shown in Table 4-3.

A,<ID>,<Message>

Table 4-3: The acknowledge message format

Section	Description	Action
A	The Acknowledge Code	The code indicating that this is an acknowledge message
<ID>	Command ID	The ID for this command sequence. This will start at zero and increment by one for every acknowledgement sent. The number will reset to zero at the start of the execution of the Print Server 2
<Message>	Message Copy	A copy of the client command message that this acknowledgement is for

3.2.4 Information Messages

The messages sent by the Print Server 2 to provide information on the state of the current operation use the format shown in Table 4-4.

I,<ID>,<Information Code>,<Information>

Table 4-4: The information message format

Section	Description	Action
I	The Information Code	The code indicating that this is an information message

Section	Description	Action
<ID>	Command ID	The ID for this command sequence. This will match the ID in the associated acknowledgement and complete messages
<Information Code>	The Information Code	The code indicating the type of information held in this message (see Information Message Codes on page 34 for the meaning of the codes)
<Information>	The Information	The text representation of the information being sent This information may be further broken up into comma separated text (see Information Message Codes on page 34 for the format of the information)

There are two ways to receive information messages. The first is to register as a listener by sending the Register Listener command for the appropriate engine component (see Client Command Message Operation Codes on page 15) to the server. When using this method, all information ever sent by the engine component will be sent to the client, and the ID in all information messages will match the ID of the register listener command. This command does not conform to the standard structure in Figure 4.1. This command will work in parallel with all other commands that can be sent to the engine component.

When using the register listener approach, information messages may come back at any time (including when no command is currently being processed by the Print Server 2). It is therefore recommended that the client is always reading the TCP/IP responses to ensure no information messages are missed

The second way to receive information messages is add the server prefix to the front of the command that will receive information messages. The format of the server prefix is shown in Table 4-5. In this method, information will only be sent to the client between this command being sent and the associated complete message being returned, and the IDs of all information messages related to the command will match the ID of the command.

<SERVER>0,<Info Level>

Table 4-5: The server prefix format

Section	Description	Action
<SERVER>0	The Server Code	The text '<SERVER>0' indicates that the message also contains some information for the server
<Information Level>	The Information Level	The level of information to be returned. This can be: • 0 - No information • 1 - Status information only • 2 - All information

The number of information messages received may vary between different operations, and between different executions of the same operation. It is therefore strongly recommended that a count of the number of information messages is not used to trigger events or the start of new operations

3.2.5 Complete Messages

The messages sent by the Print Server to acknowledge a client command message use the format shown in Table 4-6.

C,<ID>,<Error Code>,<Return Information>(Optional)

Table 4-6: The complete message format

Section	Description	Action
C	The Complete Code	The code indicating that this is a Complete message
<ID>	Command ID	The ID for this command sequence. This will match the ID in the associated acknowledgement message
<Error Code>	Error Code	The code indicating the result of the engine operation. A code of 0 indicates that it was successful. A negative value indicates an error (see Complete Message Error Codes on page 42 for the value meanings)
<Return Information>	Information Returned	Some commands return additional information. If the command does not return any, this section will not be part of the message

The complete messages being returned will not necessarily come back in the same order as the client command messages were sent, so it is vital that the ID in the message is checked to determine the client command message it is associated with

4 Connection

4.1 Connection Procedure

If the server only allows authorised clients to connect to it, the server will send an authorisation request message to the client as soon as the connection is initiated. This request will contain a random authorisation key. In order for the client to prove that it is authorised, it must change the key correctly and send it to the server in an authentication response message. If the response key is correct, the server will return an authentication completed message (see the example in Successful Connection on page 46). If the response key is incorrect, the server will return an authentication failed message (see the example in Unsuccessful Connection on page 46).

If the server allows any client to connect to it, the server will send an authentication completed message to the client as soon as the connection is initialised i.e. the key exchange is bypassed.

4.2 Connection Stage Codes

This section describes the code to enter into connection messages (see Connection Messages on page 10) to perform a stage in the connection process.

Stage	Code	Variables
Not Accepting Connections The server is not accepting client connections. This could be because the server has been shut down, or because it did not initialise sufficiently This message is sent from the server to the client	N	N/A
Authentication Request The server only allows authorised clients to connect to it, and has requested an authorisation key This message is sent from the server to the client	A	<Authorisation Key>
Authentication Response The client has responded to an authentication request with a response key This message is sent from the client to the server	R	<Response Key >
Connection Completed The client has successfully connected to the server This message is sent from the server to the client	C	N/A
Authentication Failed The client failed to connect to the server as the authentication response was incorrect This message is sent from the server to the client	F	N/A

5 Client Command Message Operation Codes

This section describes the code to enter into client command messages (see Connection Messages on page 10) to perform a specific operation within the Print Server 2. For examples of how to use the operation codes to perform complete tasks, please see Example Command Sequences on page 46. The return info is contained in the associated complete message.

Reminder - the client command message format comprises Engine Code (S, R, P, M), Operation Code and Variables. See Client Command Messages on page 10 for complete details

Sets of variables and return info specified in square brackets ([]) can be repeated a variable number of times, with each repetition separated by a comma

5.1 Print Server 2

Note - all codes listed for the Print Server 2 assume the Engine Code prefix 'S'

Operation	Code	Variables	Return Info
Register For Print Server 2 Information Register for Print Server 2 information The return existing information parameter can be "True" or "False"	L	<Return Existing Information> (optional)	N/A
Wait Until Initialised Wait until the Print Server 2 has finished initialising. The complete message will only be returned when the server has fully initialised	I,W	N/A	N/A
Save Configurations As Save all configurations in the folder specified - see Print Server Note - 2 on page 17	C,SA	<Configuration Folder Path>	N/A
Save Configurations Save all configurations in the current folder - see Print Server Note - 2 on page 17	C,S	N/A	N/A
Apply System Mode Apply the system mode with the name specified	T,M	<System Mode Name>	N/A

Operation	Code	Variables	Return Info
Get System Mode Names Get all of the system mode names The returned system mode names will be a semicolon separated list	T,N	N/A	<Active System Mode(zero-based index number)>,<System Mode Names (string)>
Get System Mode Information Get the information for the specified system mode	T,I	<System Mode Name>	<Render Mode Name>;<Print Mode Name>
Abort Abort and delete all server and engine components TCP/IP communications will be suspended during the abort - see Print Server Note - 1 on the next page	O,A	N/A	N/A
(Re)initialise Initialise or reinitialise the Print Server 2 and all engine components using the current configuration folder. Before the initialisation, the Print Server 2 and all engine components will be aborted and deleted. TCP/IP communications will be suspended during the abort. If the configuration folder parameter is specified, this will be used when the Print Server 2 is reinitialised. If it is not specified, the current configuration folder will be used	O,I	<Configuration Folder>(optional)	N/A
Shutdown Abort and shutdown the Print Server 2. This will close the TCP/IP connection and so the complete will be returned before the shutdown has fully finished. A PC operation code parameter value of 'R' will restart the PC and a parameter of 'S' will shut down the PC	O,S	<PC Operation Code>(optional)	N/A
Change Parameter Value Change the value of the parameter specified in the Print Server. Each pair of names and values are separated by a comma. For more information about changing parameters, please see Change and Get Parameter Commands on page 30	C,P	[<Parameter Name>,<Parameter Value>]	N/A

Operation	Code	Variables	Return Info
Get Parameter Value Get the text representation of the value of the parameter specified in the Print Server 2. More than one name can be specified as a comma separated list. For more information about getting parameters, please see Change and Get Parameter Commands on page 30 The parameter values returned will be a comma separated list of values	V,P	<Parameter Name>	<Parameter Value>

Print Server Note - 1

It is recommended to have two TCP/IP clients setup, one for Printing commands and the second for Abort commands

Print Server Note - 2

For this command to save successfully, the destination path needs to have been set up previously:

1. Create a folder at the path: C:\ProgramData\Global Inkjet Systems\GIS Inkjet OS 2\Sample
2. Use the relevant command, e.g. for the Print Server Save Configuration As = "S,C,SA,C:\ProgramData\Global Inkjet Systems\GIS Inkjet OS 2\Sample"

5.2 Render Engine

Note - all codes listed here for the Render Engine assume the Engine Code prefix 'R'

Operation	Code	Variables	Return Info
Register For Render Engine Information Register for Render Engine information The return existing information parameter can be "True" or "False"	L	<Return Existing Information> (optional)	N/A
Save Render Manager Configuration Save the Render Engine configuration using the current file path	C,S	N/A	N/A
Apply Render Mode Apply the render mode with the name specified	T,M	<Render Mode Name>	N/A
Load VPI Document Load the VPI document specified	D	<VPI File Path>	N/A
Prime For Rendering Prime the Render Engine to make the first render as fast as all other renders This is only relevant after a document has been loaded, and when performing a number of renders such as rendering labels or rendering on demand	PR	N/A	N/A
Start Render Render the current document, saving the RIP files created to the location specified (see Printing RIP Files on page 29 for more information on RIP file paths) The final variable is not used	R	<Path to RIP File>,0	N/A

Operation	Code	Variables	Return Info
Render to Bitmap Render an input image (TIFF, BMP, or JPEG) and save the colour planes as bitmap images to the output RIP file path specified (see Printing RIP Files on page 29 for more information on RIP file paths) If the output path contains '<Export>', this part will be replaced with the path defined in the Render Engine configuration for each colour plane The output dimensions are defined in millimetres. These are optional, and if they are not included or are set to zero then the output files will have the dimensions of the input image If Max Preview Width & Height are present and non-zero then a preview image will be produced (see Printing RIP Files on page 29 for details)	B	<Input Image Path>, <Output RIP file path>,<Output Width> (Optional) ,<Output Height> (Optional), <Max Preview Width> (Optional), <Max Preview Height> (Optional)	N/A
Start Render Labels Render the current document the number of times specified, incrementing the global counter each time. The RIP files are sent straight to the Print Controller The first variable is not used This command should only be sent once in the Print Queue mode	F	0,<Start Label Number>,<Number of Labels>	N/A
Start Render On Demand Start the render on demand mode The variable is not used	RD,S	0	N/A
Add Render On Demand Item Add a render on demand item using the current document configuration This is only relevant when rendering on demand	RD,A	N/A	N/A
End Render On Demand No more render on demand items to add This is only relevant when rendering on demand	RD,E	N/A	N/A
Change File Change the file path of the image to be loaded	F,L	<Image File Path>	N/A
Load Image Load the image from the current image file path	IL	<Number of Times to Load Image>	N/A

Operation	Code	Variables	Return Info
Start Load on Demand Start the load on demand mode	LD,S	N/A	N/A
Add Load on Demand Image Load an image on demand, using the current image file path This is only relevant when in the load on demand mode	LD,A	N/A	N/A
End Load on Demand End the load on demand mode This is only relevant when in the load on demand mode	LD,E	N/A	N/A
Abort Abort the current render This is only relevant when rendering This command may or may not send a complete message, depending on the Print Server configuration	A	N/A	N/A
Increment Global Counter Increment the global counter by one	G,I	N/A	N/A
Decrement Global Counter Decrement the global counter by one	G,D	N/A	N/A
ApplyParameters When a document has been loaded, it can have a number of parameters for changing values in the Print and Render engines. This applies the parameter changes specified (Call this prior to starting a print to ensure the parameters affect the print)	ADP	<ApplyRenderEngineParams>, <ApplyPCEngineParams>	N/A
Set Global Counter Set the global counter	G,S	<Global Counter Value>	N/A
Get Preview Get a preview of the currently loaded document The width and height specify the size of the size of the preview to return, in pixels For more information about the bitmap data returned, see Get Preview on page 31	GPR	<Width>,<Height>	<Bitmap Data>

Operation	Code	Variables	Return Info
Change Parameter Value Change the value of the parameter specified in the Render Engine and / or the currently loaded VPI document. Each pair of names and values are separated by a comma. For more information about changing parameters, please see Change and Get Parameter Commands on page 30	C,P	[<Parameter Name>,<Parameter Value>]	N/A
Get Parameter Value Get the text representation of the value of the parameter specified in the Render Engine and/or the currently loaded VPI document. More than one name can be specified as a comma separated list. For more information about getting parameters, please see Change and Get Parameter Commands on page 30 The parameter values returned will be a comma separated list of values	V,P	<Parameter Name>	<Parameter Value>

5.3 Print Controller

Note - all codes listed here for the Print Controller assume the Engine Code prefix 'P'

Operation	Code	Variables	Return Info
Register For Print Controller Information Register for Print Controller information The return existing information parameter can be "True" or "False"	L	<Return Existing Information>(optional)	N/A
Upgrade HIB Firmware Upgrade HIB firmware remotely	UPG, HFW	N/A	N/A
Upgrade PMB Firmware Upgrade PMB firmware remotely	UPG, PFW	N/A	N/A
Save Print Controller Configuration Save the Print Controller configuration using the current file path	C,S	N/A	N/A
Apply Print Mode Apply the print mode with the name specified	T,M	<Print Mode Name>	N/A
Print Print a number items. The item is shown in the square brackets, and consists of the image to print and the number of copies of the image (see Printing RIP Files on page 29 for more information on RIP file formats and paths) Multiple images can be queued up by adding more items to the command Note - the number of prints parameter (P,P,1) should always be set to 1	P,1	<RIP File Path>,<Number of Copies>]	N/A
Initialise Print Initialise a print. The print is initialised in the same way as in the Print command, but the command will complete when the print is ready to begin instead of when the print has finished. The print will not start until a Start Print command is sent Note - the number of prints parameter (P,PI,1) should always be set to 1	PI,1	[<RIP File Path>,<Number of Copies>]	N/A

Operation	Code	Variables	Return Info
Start Print Start the initialised print This is only relevant if a print has already been successfully initialised using the Initialise Print command	PT	N/A	N/A
Start Print Queue Mode Continue to print every item added to the queue until told to stop	Q,P	N/A	N/A
End Of Print Queue Mode No more items to add to the print queue. The complete message for this message will only be returned once the print has completed. This is only relevant when printing in queue mode	Q,E	N/A	N/A
Add Print Queue Item Add an item to the print queue. The item consists of the path of the RIP files to print, and the number of copies of this RIP to print consecutively (see Printing RIP Files on page 29 for more information on RIP file paths) Multiple images can be queued up by adding more items to the command This is only relevant when printing in queue mode	Q,A	[<RIP File Path>,<Number of Copies>]	N/A
Wait For Print Initialisation Wait for the print initialisation to completely finish	Q,WIP	N/A	N/A
Wait For Print Finished Wait for the print to completely finish	PW,F	N/A	N/A

Operation	Code	Variables	Return Info
Start Spit Start to spit all enabled printheads. This will return immediately and not when the spit finishes. The Wait For Spit To Finish command must be called after this command completes in order to wait for the spit to finish The finish of the Spit command should be verified before sending any change parameter commands or initiating a print. If this is not done the parameter changes may not take effect or there may be odd artefacts in the print Grey Level is an integer value and relates to the grey level at which the spit performs	G,T	<Frequency in Hertz>,<Duration in Seconds>,<Grey Level> Grey Level Parameters • -1=DefaultSpittingGreyLevel • 0=GreyLevel 0 • 1=GreyLevel 1, etc.	N/A
Stop Spit Stop the current spit This is only relevant when currently spitting	G,O	N/A	N/A
Wait For Spit To Finish This does not complete until the currently executing spit finishes This is only relevant when currently spitting It is important to verify the finish of the Spit command before sending any change parameter commands or initiating a print. If this is not done the parameter changes may not take effect or there may be odd artefacts in the print	GW,F	N/A	N/A
Abort Abort the current print or spit See Abort Print on page 54 for example details	A	N/A	N/A
Pause Print Pause the current print This is only relevant when currently printing	U	N/A	N/A
Resume Print Resume the current print This is only relevant when currently paused	R	N/A	N/A

Operation	Code	Variables	Return Info
Send Software Print Go Send a software print go to all connected PMBs	SPG	N/A	N/A
Jog Transport Mechanism Jog the transport mechanism in the direction specified at the velocity specified	J	<Direction>,<Speed> Direction can be: • 0 - Zero X • 1 - Limit X • 2 - Zero Y • 3 - Limit Y • 4 - Zero Z • 5 - Limit Z Speed can be: • 0 - Slow jog speed • 1 - Fast jog speed	N/A
Move Transport Mechanism To Destination Move the transport mechanism to the pre-defined destination specified	M	<Destination> Destination can be: • 0 - Performs Home • 1 - Start position • 2 - Load substrate position • 3 - Maintenance position • 4 - User position	N/A
Move Transport Mechanism To Position Move the transport mechanism to the position specified at the speed specified	M,P	<X Position in mm>,<Y Position in mm>,*<Z Position in mm>*,<X Speed in mm/s>,<Y Speed in mm/s>,*<Z Speed in mm/s>* **Z is optional*	N/A
Stop Moving Stop the transport mechanism	SM	N/A	N/A
Purge Ink System Purge the ink system	IS,P	N/A	N/A
Turn Printhead Heaters On Turn on the heaters in all enabled printheads	HT,N	N/A	N/A
Turn Printhead Heaters Off Turn off the heaters in all enabled printheads	HT,F	N/A	N/A

Operation	Code	Variables	Return Info
Set Printhead Target Temperatures Set the target temperature in all enabled printheads	HT,T	<Temperature in Degrees Celsius>	N/A
Read Printhead Status Read the current status of all enabled printheads and force a printhead status information message to be returned This is not valid when the Print Controller is setup to read the printhead status when idle	HT,R	N/A	N/A
Delete Print Data Directory Delete all RIP files in the comma separated list of directories defined (see Printing RIP Files on page 29 for more information on RIP files)	PD,D	<Directories>	N/A
Delete Print Data File Delete all of the RIP files defined by the comma separated list of paths to the base RIP files (see Printing RIP Files on page 29 for more information on RIP file paths)	PD,F	<File Paths>	N/A
Get Error State This returns the error state code of a specified node For more information about getting the error state, see Get Error State on page 32	V,ES	[<Node Name>]	[<Error Code>]
Change Parameter Value Change the value of the parameter specified in the Print Controller. Each pair of names and values are separated by a comma. For more information about changing parameters, please see Change and Get Parameter Commands on page 30 It is important to note that some parameters can take time to take effect, for example enabling or disabling hardware. Best practice is to minimise the number of parameter changes performed before a print. Alternatively, please verify that the changes have taken effect before starting a print	C,P	[<Parameter Name>,<Parameter Value>]	N/A

Operation	Code	Variables	Return Info
Get Parameter Value Get the text representation or value of the parameter specified in the Print Controller. More than one name can be specified as a comma separated list. For more information about getting parameters, please see Change and Get Parameter Commands on page 30 The parameter values returned will be a comma separated list of values	V,P	<Parameter Name>	<Parameter Values>

5.4 Print Server Monitor

Note - all codes listed for here the Print Server Monitor assume the Engine Code prefix 'M'

Operation	Code	Variables	Return Info
Initialise Print Server Monitor Initialise/reinitialise the Print Server Monitor using the configuration file specified	I	<Print Server Monitor Configuration File Path>	N/A
Start Print Server Start the Print Servers with the names specified. The names are a comma separated list. If no names are specified, all Print Servers are started	T	<Print Server Names>	N/A
Shutdown Print Server Shutdown the Print Servers with the names specified. The names are a comma separated list. If no names are specified, all Print Servers are shut down	H	<Print Server Names>	N/A
Restart Print Server Restart the Print Servers with the names specified. The names are a comma separated list. If no names are specified, all Print Servers are restarted	R	<Print Server Names>	N/A
Abort Abort the Print Server Monitor This command may or may not send a complete message, depending on the Print Server Monitor configuration	A	N/A	N/A
Change Parameter Value Change the value of the parameter specified in the Print Server Monitor Each pair of names and values are separated by a comma. For more information about changing parameters, please see Change and Get Parameter Commands on page 30	C,P	[<Parameter Name>,<Parameter Value>]	N/A
Get Parameter Value Get the text representation or value of the parameter specified in the Print Server Monitor. More than one name can be specified as a comma separated list. For more information about getting parameters, please see Change and Get Parameter Commands on page 30 The parameter values returned will be a comma separated list of values	V,P	<Parameter Name>	<Parameter Values>

5.5 Printing RIP Files

Some of the commands in section 6 Client Command Message Operation Codes refer to a 'RIP File Path'. There will be a separate RIP file for each colour plane to be printed, so the RIP file path actually refers to a set of images. The path in the parameter is the base path name, which is modified by adding '_<Colour Plane Index>' to the end of the file name to give the actual path for a RIP file for a particular colour plane.

When the Render Engine is told to render to a base RIP file path, it will automatically adjust the path(s) of the file(s) it outputs. When the Print Controller is told to print from the base RIP file path, it will automatically adjust the path(s) to look for the RIP images for the colour plane(s) it is interested in.

For example, if the Render Engine is setup to output to four colour planes, and the command 'R,R,C:\RenderImages.bmp,0' is received, the following files will be produced.

- C:\RenderImages_0.bmp
- C:\RenderImages_1.bmp
- C:\RenderImages_2.bmp
- C:\RenderImages_3.bmp

If a preview image has been specified, either with the SaveRenderPreview flag in the RenderManager configuration, or by passing non-zero values in with the R,B command for Max Preview Width and Max Preview Height, then a preview image will be produced in Windows bitmap format using the base path name with '_P' added.

If the Print Controller is only setup to print colour planes 1 and 3 and the command 'P,P,1,C:\RenderImages.bmp,1' is received, it will only look for the following files.

- C:\RenderImages_1.bmp
- C:\RenderImages_3.bmp

RIP files must be in one of the formats: Windows bitmap (BMP), Tagged Image File Format (TIFF), or GIS RIP Image (GRI).

For RIP files in Windows bitmap format the extension must be **'.bmp'.** The bitmap can be a 1 bit per pixel (1bpp), a 2 (2bpp) or a 4 bit per pixel (4bpp) file, depending on the number of grey scale levels that need to be represented in the file. Bitmap files with 8 bits per pixel (8bpp), 24 bits per pixel (24bpp) and 32 bits per pixel (32bpp) are not supported.

For RIP files in Tagged Image File Format (TIFF), the extension must be **'.tif'.** The image data must be 1 or 4bpp, and organized with a single colour plane in each file. Note: The image data may be compressed, but if so then EITHER the strip height must be set to one row OR the image may only be printed with the configuration FlipImageinY set.

The GIS RIP Image (GRI) RIP file format is a specialised format for high performance applications. For further information, contact GIS

The value of each pixel represents the grey scale level that should be used when this pixel is printed. When a 1bpp file is being used, a pixel bit value of 0 means no data should be printed and a pixel bit value of 1 means grey scale 1 should be printed. The RGB palette in the bitmap file will however be examined to determine whether or not the image should be inverted i.e. a pixel bit value of 1 means that data should not be printed. The input will be inverted if palette entry 0 is RGB (0,0,0) and palette entry 1 is RGB(255,255,255). When a 4bpp file is being used, the RGB palette will be ignored (as it can be

ambiguous), and so the index entries are used directly i.e. a pixel value of 0 represents grey level 0, a pixel value of 1 represents grey level 1, etc.

5.6 Change and Get Parameter Commands

The variables associated with a change parameter message (for any Engine Component) takes the form of a comma separated pair of text values. The first value in the pair identifies the parameter(s) to change (see **Identifying Parameters below**), and the second value in the pair specifies the new value for the parameter(s). The variable associated with a get parameter message is a text value identifying the parameter to retrieve (see **Identifying Parameters below**). More than one of these pairs or names can be included in the list of variables (with each pair or name separated by a comma) to perform a number of change or get parameter operations using a single command.

The text value to set in a change parameter command will automatically be converted into the type appropriate for the parameter(s) specified, and the value retrieved will automatically be converted to text. If the parameter is a Boolean parameter, the text equivalent of the value is "True" or "False". All decimal values can be up to 6 decimal places. The value will be truncated to 6 decimal places if more are defined. The value for a choice parameter must be one of the names associated with the parameter, rather than the value associated with the name or the index of the name in the list.

If the new parameter value contains commas, the value should be listed between quote marks ("") to avoid the message being split incorrectly. If more than one parameter is defined in the get parameter message, the value returned will be in the form of a comma separated list of values. The order of the values returned will match the order which the parameters were defined in the get parameter message. If a value to return contains commas, it will be listed between quote marks ("").

5.6.1 Identifying Parameters

The first method of identifying the parameter(s) is through unique IDs. Any parameter can have a unique ID associated with it, and the parameter change operation will change the value of all parameters that have this unique ID. The change or get parameter command will assume that a parameter name that does not contain commas is a unique ID, and so therefore the unique ID cannot contain commas.

The second method for identifying the parameter(s) is to specify the path to the parameter. The path takes the form of a comma separated list of text, which consists of a series of (case sensitive) node names, ended with the (case sensitive) name of the parameter to change. In order to ensure that the path is interpreted as a series of unique IDs, the entire path should be between a pair of quote marks (“”). To avoid the path being split incorrectly, no node name in the tree can contain a comma. Every node name in the path must be the name of a child node of the previous node in the path, and the first item in the list must be the name of the root node. The only parameter(s) that will be changed will be in the last node listed in the path.

By default, the parameters at the end of all matching paths will be changed or retrieved. In order to constrain the search, information within square brackets can be put after a node name to specify which node(s) with that name should be matched. This adds the constraint that no node name in the tree can contain square brackets. The information inside the square brackets can be:

- All – All child nodes with the name specified should be matched.
- First – Only the first child node (the one at index 0) should be matched.
- Last – Only the last child node should be matched.
- <number> - Only the child node at the (zero based) index <number> should be matched.

Figure 6.1 shows a series of examples of trees with valid parameter paths. In each example, the nodes are shown in black, the parameters in green, and the parameters that will be changed or retrieved by the path specified are circled in red.

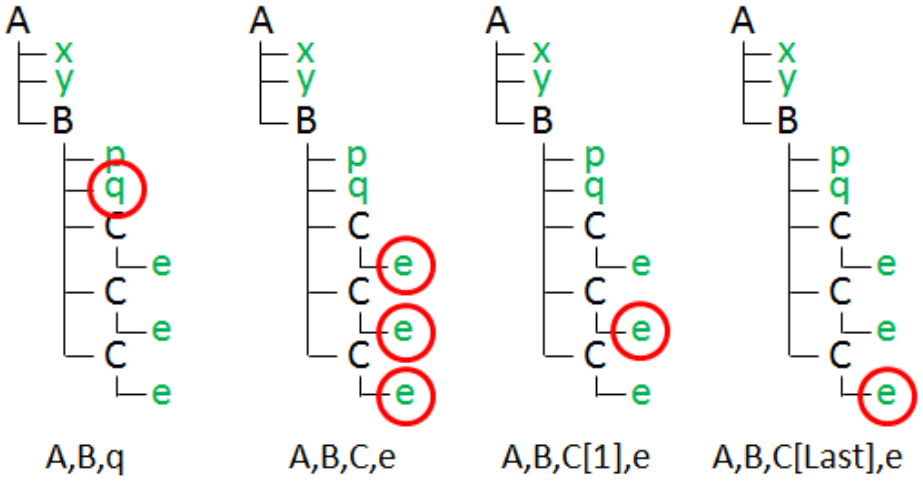

Figure 6-1: Parameter path examples

The example in Change Parameter Using Unique IDs and Paths on page 54 demonstrates a single change parameter command that will perform two parameter change operations, with one using unique IDs and the other using a path.

5.7 Get Preview

The command to get a preview of the currently loaded document returns back text containing the value of each pixel which makes up the preview.

The bitmap data takes the form "D,<width>,<height>,<pixel data>". The width and height specify the dimensions of the pixel data being returned, in pixels. Every two characters in the pixel data represents two hexadecimal digits which combine to form an integer value. A series of 3 integers (6 hex digits) represent the values of red, green and blue respectively which make up a pixel. The pixels are ordered in rows i.e. the pixels from x=0 to x=width-1 for the row at y=0 are listed first in that order, followed by the ones at y=1 up to y=height-1.

For example, a bitmap preview is shown in Figure 6.2, and shows all of the pixels which form a preview. Each pixel in the diagram shows two lines of text. The top line is the respective values of the red, green and blue components that make up the pixel colour, as decimal values. The bottom line is the same data, just represented as hexadecimal values.

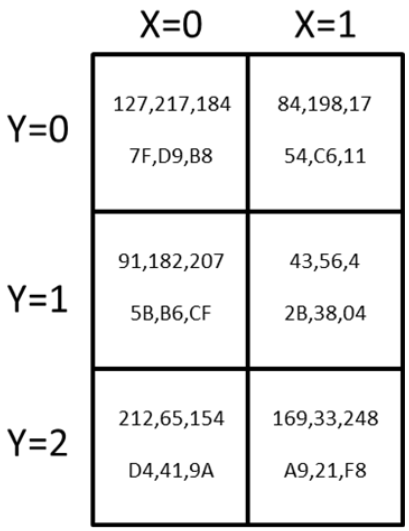

Figure 6-2: A bitmap preview example

The preview data that would be returned for this preview example is:

"D,2,3,7FD9B854C6115BB6CF2B3804D4419AA921F8".

5.8 Get Error State

The command to retrieve the error state of a node takes a list of node names as an input. The node names specified can be a Print Manager Board name, or a printhead name. The name of a Print Manager Board node will be by itself, but the name of a printhead node is of the form "<PMB node name>,<Printhead node name>". The entire node name must be surrounded in quotes, and many node names can be specified in a comma separated list. For example:

"PMB0","PMB0,Printhead1","PMB1,Printhead2","PMB3"

The error codes returned will be in the order that the nodes are defined in the command. The Print Manager Board error state codes are defined in Table 6-1 and the Printhead error state codes are defined in Table 6-2.

Table 6-1: The Print Manager Board error state codes

Code	Meaning	Description
2	Disabled	The PMB is disabled
1	Simulated	The PMB is simulated
0	Connected	The PMB is connected and communicating correctly
-1	Unknown	The communication status is in an unknown state
-2	Failed	Communication with the PMB has failed

Table 6-2: The Printhead error state codes

Code	Meaning	Description
2	Disabled	The printhead, or the PMB the printhead is connected to is disabled
1	Simulated	The PMB the printhead is connected to is simulated

Code	Meaning	Description
0	Connected	The printhead is connected and communicating correctly
-1	Unknown	The communication status is in an unknown state
-2	Failed	Communication with the printhead has failed

6 Information Message Codes

This section describes the codes and information formats contained within the information messages returned from the Print Server (see Information Messages on page 11). An example of the information messages returned during a print is given in Print on Demand via Image Loading on page 51.

6.1 Status Information

Status information messages indicate the current status of the Print Server or one of the engine components. The format of the status information message is shown in Table 6-1. This message will be returned to Render Engine and Print Controller listeners.

I,<ID>,S,<Status Text>,<Status Code>

Table 6-1: The status information message format

Section	Description	Action
S	Status Information Code	The code indicating this is a status information message
<Status Text>	The Status Text	The text description of the status
<Status Code>	The Status Code	The number code which uniquely identifies the status text. This can be: • 0 - <No Status> • 1 - Ready • 2 - Initialising • 4 - ERROR Init PMB Error • 5 - ERROR Load Config Fail • 6 - ERROR Create Logger Fail • 7 - ERROR Init Fail • 9 - ERROR Transport Failed • 10 - Initialise Complete • 11 - Loading Configuration • 12 - Printing • 13 - Starting Print • 14 - Finishing Print • 15 - Print Finished • 16 - Initialising For Print • 17 - Moving • 18 - Spitting • 19 - ERROR Security Failed • 20 - Print Initialised • 21 - Initialising For Spit • 22 - Finishing Spit • 23 - Spit Finished

6.2 Backward Compatible Status Messages

Get hardware status messages to identify PMB and HIB electronics errors. The messages include hardware identifying information, such as the board serial number and the PMB channel an HIB is connected to. Disabling the Print Controller parameter **BackwardCompatibleStatusMessages** in the Print Manager node will enable the following extended hardware status messages:

Table 6-2: Backwards Compatible Status messages

Section	Code	Description
HIB Error	S,I,HIB Electronics Error - [X]	Where X is the serial number of the PMB that the HIB is attached to

Section	Code	Description
HIB Error	S,I,HIB [Y] Electronics Error - [X]	Where X is the serial number of the PMB that the HIB is attached to and Y is the PMB channel the HIB is attached to
PMB Error	S,I,PMB Electronics Error - [X]	Where X is the serial number of the PMB

6.3 Traffic Light Information

Traffic light information messages provide codes for setting a traffic light which indicates the current state of the Print Server. The format of the status information message is shown in Table 6-3.

I,<ID>,T,<Traffic Light Code>

Table 6-3: The traffic light status information message format

Section	Description	Action
T	Traffic Light Code	The code indicating that this is a traffic light information message
<Traffic Light Code>	The Traffic Light Code	The number code which uniquely identifies the traffic light status This can be: • 0 - Ready • 1 - Preparing • 2 - Printing • 3 - Error

This message will be returned to Print Controller listeners.

6.4 Swathe Processed Information

Swathe processed information messages give the zero-based number of the swathe which has been fully downloaded to the PMB by the Print Controller. The format of the swathe processed information message is shown in Table 6 - 4.

I,<ID>,SP,<Swathe Number>

Table 6-4: The current swathe number information message format

Section	Description	Action
SP	Swathe Processed Code	The code indicating that this is a swathe processed information message
<Swathe Number>	The Swathe Number	The swathe number which has been processed

This message will be returned to Print Controller listeners.

6.5 Current Label Number Information

Current label number information messages give one-based number of the label / swathe currently being printed by the Print Controller. The format of the current label number information message is shown in Table 6-5.

I,<ID>,L,<Label Number>

Table 6-5: The current label number information message format

Section	Description	Action
L	Current Label Number Code	The code indicating that this is a current label number information message
<Label Number>	The Label Number	The label / swathe number currently being printed

This message will be returned to Print Controller listeners.

6.6 Print Transport Mechanism Position Information

Print Transport Mechanism position information messages give the current position of the Print Transport Mechanism. The format of the print transport mechanism position information message is shown in Table 6-6.

I,<ID>,X,<X Position>,Y,<Y Position>,Z,<Z Position>

Table 6-6: The print transport mechanism information message format

Section	Description	Action
X	X Position Code	The code indicating that the next value describes the position of the x-axis of the Print Transport Mechanism
<X Position>	The X Position	The current position of the x-axis of the Print Transport Mechanism
Y	Y Position Code	The code indicating that the next value describes the position of the y-axis of the Print Transport Mechanism
<Y Position>	The Y Position	The current position of the y-axis of the Print Transport Mechanism
Z	Z Position Code	The code indicating that the next value describes the position of the z-axis of the Print Transport Mechanism This will only be returned if the Print Controller has a z-axis defined
<Z Position>	The Z Position	The current position of the z-axis of the Print Transport Mechanism This will only be returned if the Print Controller has a z-axis defined

This message will be returned to Print Controller listeners.

6.7 Ink System Parameter Value Information

Ink system parameter value information messages return the value of a specified parameter in the Ink System. The format of the ink system parameter value information message is shown in
Table 6-7.

I,<ID>,I,<Parameter Name>,<Parameter Value>

Table 6-7: The Ink System parameter value message format

Section	Description	Action
I	Ink System Parameter Value Code	The code indicating that this is an ink system parameter value message

Section	Description	Action
<Parameter Name>	Parameter name	The name of the parameter
<Parameter Value>	Parameter value.	The value of the parameter

This message will be returned to Print Controller listeners.

6.8 Printhead Status Information

Printhead status information messages contain the status of the printheads in the Print Controller. The format of the printhead status information message is shown in Table 6-8.

I,<ID>,H,<Status>

Table 6-8: The printhead status information message format

Section	Description	Action
H	Printhead Status Code	The code indicating that this is a printhead status information message
Status	Printhead Status	The status of all printheads in the Print Controller

This message will be returned to Print Controller listeners

As this message may be returned many times, it will not be recorded in the GIS server communication log.

The printhead status information is in an XML format, with each XML item separated by the ASCII value 23 (hex value 17). Each node takes the following format:

<Name ParameterName="Value" ParameterName="Value">

'Name' is the name of this node, 'ParameterName' is the name of a parameter associated with this node and 'Value' is the value associated with this parameter. The node can have zero or more parameters associated with it. The node definition may be preceded with a number of spaces, which is formatting which helps indicate the structure of the XML and can be ignored.

Every node listed is a child node of this node until the following item is read:

</Name>

This item indicates that the section for the node 'Name' has finished, so the next node to be defined will be a sibling of this node instead of a child.

The first node listed is called the root node. In the XML returned, this will always be called "PrintHeadStatusXML" and has no parameters.

An example of an XML structure is given below, where each item is on a new line:

<A P1="1" P2="2">

```
  <B P3="a" P4="b" P5="c" P6="d">
    <C P7="y" P8="z">
    </C>
  </B>
  <D>
  </D>
</A>
```

In this example, node "A" is the root node, node "A" is the parent of nodes "B" and "D", node "B" is the parent of node "C" and nodes "B" and "D" are siblings.

The structure of the XML returned will match the structure of the nodes contained in the Print Controller configuration. The name of each node will be the type of node, and the description of all of the parameters in the various nodes are given in Table 7-8.

Table 7-8: Printhead status parameter descriptions

Parameter Name	Description
CurrentTemperature	The current temperature of the printhead
Handle	Not currently supported
HeadEnabled	Whether this head is enabled or not (this parameter will only have the value "True" or "False")
HeaterEnabled	Whether the heater is enabled in this head or not (this parameter will only have the value "True" or "False")
Name	Not currently supported
NodeName	The name of the node, as displayed in the Tree Node Editor dialog
SpitEnabled	Whether this head is enabled for spitting or not
TargetTemperature	The target temperature for the printhead
Type	Not currently supported

6.9 Print Started information

Print started information messages signal that the Print Controller has finished initialising for a new print. The format of the print started information message is shown in Table 6-9.

I,<ID>,P

Table 6-9: The print started information message format

Section	Description	Action
P	Print Started Code	The code indicating that this is a print started information message

This message will be returned to Print Controller listeners.

6.10 Ready to Print Information

Ready to print information messages signal that the Print Controller is ready to start printing. The format of the ready to print information message is shown in Table 6-10.

I,<ID>,RTP,<Number Of Swathes>

Table 6-10: The ready to print information message format

Section	Description	Action
RTP	Ready To Print Code	The code indicating that this is a ready to print information message
<Number Of Swathes>	The Number Of Swathes	The number of swathes that make up the print

This message will be returned to Print Controller listeners.

A PMB will be "Ready To Print" when ONE of the following conditions are met:

1. It has downloaded at least the PMB Pre Buffer Size specified by the user on all active channels

This size is set using one of the following:

- PMBBufferScheme = Memory -> PMBPreBufferMemorySize is used
- PMBBufferScheme = Swathes -> PMBPreBufferSwathesSize is used

2. It has filled the Maximum PMB Buffer Size and the Maximum Swathe Size specified by the user on all active channels

PMB Buffer Size is set using one of the following:

- PMBBufferScheme = Memory -> PMBBufferMemorySize is used
- PMBBufferScheme = Swathes -> PMBBufferSwathesSize is used

Swathe Size is set using one of the following:

- QueueSizeScheme = Memory -> QueueMemorySize is used
- QueueSizeScheme = Swathes -> QueueSwatheSize is used

3. The Print Controller knows that there is no more data to add. For example:

A print job of only 5 swathes (less than the buffers above) has been started

A P,Q,E has been issued sometime after the **P,Q,P** .

4. It has filled the available memory on the PMB (this might be smaller than the specified PMB Buffer Size) and the swathe size

Please note that a RTP will never be returned if these conditions are not met

Typical situations include:

1. Insufficient image data has been added to meet any of the conditions above
2. No P,Q,E has been issued after all data has been added

6.11 End Of Printing Information

End of printing information messages signal that the Print Controller has finished printing. The format of the end of printing information message is shown in Table 6-11.

I,<ID>,EP

Table 6-11: The end of printing information message format

Section	Description	Action
EP	End Of Printing Code	The code indicating that this is an end of printing information message

This message will be returned to Print Controller listeners.

6.12 Log Message Information

Log message information messages signal that a log message has been displayed on the Print Server interface. The format of the log message information message is shown in Table 6-12.

I,<ID>,G,<Log Level>,<Log Message>

Table 6-12: The log message information message format

Section	Description	Action
G	Log Message Code	The code indicating that this is a log message information message
<Log Level>	Log Level	The code indicating what type of log message this is This can be: • 0 - Info • 1 - Warning • 2 - Error
<Log Message>	Log Message	The log message

This message will be returned to Print Server listeners.

7 Complete Message Error Codes

This section describes the meaning of the error codes contained in a complete message.

7.1 Standard Error Codes

These codes can be returned by the Print Server or any engine component.

Code	Error
0	General success
-1	Unknown command
-5	Incorrect parameters in message
-8	The Print Server has been suspended (this usually occurs while the Print Server is restarting or shutting down)

7.2 Print Server Error Codes

Code	Error
-2	Failed to load Print Server configuration or failed wait until the Print server finished initialising
-160	Failed to wait until the Print Server initialised
-161	Failed to register for Print Server information
-165	Operation initialised failed
-166	Operation abort failed
-167	Operation restart failed
-168	Operation shut down failed
-170	Failed to save all configurations
-171	Failed to save all configurations as
-185	Failed to get the system mode information
-186	Failed to apply system mode
-188	Set Print Server parameter value failed
-189	Get Print Server parameter value failed

7.3 Render Engine Error Codes

Code	Error
-6	Get parameter value failed
-100	General Render Engine failure
-101	Render Engine busy
-102	Failed to load Render Engine configuration
-104	Failed to initialise the Render Engine

Code	Error
-106	Failed to create the Render Engine logging directory
-110	Failed to load the VPI document
-115	Failed to prime for rendering
-121	Failed to render
-127	Get document preview failed
-128	Abort failed
-131	Failed to render on demand
-132	Failed to start rendering on demand
-133	Failed to end rendering on demand
-134	Failed to add a non-render command to the render on demand mode
-135	Failed to add a render command to the render on demand mode
-140	Failed to change Render Engine parameter value
-150	Failed to apply render mode
-520	Failed to load an image
-530	Failed to start the load on demand mode
-531	Failed to end the load on demand mode
-532	Failed to add a non-load command to the load on demand mode
-533	Failed to add a load command to the load on demand mode
-540	Failed to change the file path

7.4 Print Controller Error Codes

Code	Error
-4	Set parameter value failed
-6	Get parameter value failed
-7	Failed to apply the print mode
-201	Print Controller busy
-202	General Print Controller command failure
-203	Failed to load Print Controller configuration
-204	Failed to create Print Controller logging directory
-205	Print Controller initialisation terminated
-206	Print Controller initialisation failed
-207	Transport mechanism initialisation failed
-208	Print manager board initialisation failed
-209	DEPRECATED: This error code is no longer returned
-210	Print failed

Code	Error
-211	DEPRECATED: This error code is no longer returned
-212	Transport mechanism printing failed
-213	Print manager board printing failed
-214	Failed to start print queue mode
-215	Failed to end print queue mode
-216	Print Controller not initialised
-217	Print Controller security failed
-220	Failed to add item to queue
-225	Failed to successfully wait for the print to initialise
-227	Failed to initialise the print
-228	Failed to start the initialised print
-229	Failed to wait until the print has finished
-230	Spit failed
-231	Ink system purge failed
-232	Stop spit failed
-233	Wait for spit finished failed
-234	Wait for spit to finish
-235	Abort failed
-236	Pause print failed
-237	Resume print failed
-240	Failed to start the printhead status monitor
-250	Failed to stop the printhead status monitor
-255	Failed to get the error state
-260	Failed to turn printhead heaters on
-262	Failed to send data in raw pixel data mode
-263	Failed to start raw pixel data mode
-265	Failed as not in raw pixel data mode
-266	Failed as wrong colour plane
-267	Failed as parameter out of range
-268	Failed as invalid BPP or line width parameters
-269	Failed as colour plane(s) missing
-270	Failed to turn printhead heaters off
-275	Failed to delete the print data directories
-276	Failed to delete the print data files

Code	Error
-278	Failed to send a software print go
-280	Failed to set target head temperatures
-281	Failed to read the head status
-285	Failed to find the print scheme
-286	Failed to update the nozzle table
-287	Failed to reset the nozzle table

7.5 Print Server Monitor Error Codes

Code	Error
-1000	General Print Server Monitor failure
-1001	Print Server Monitor busy
-1010	Failed to initialise the Print Server Monitor
-1020	Failed to abort the Print Server Monitor
-1030	Failed to start the Print Servers
-1031	Failed to shut down the Print Servers
-1032	Failed to restart the Print Servers
-1040	Failed to change a Print Server Monitor parameter value
-1041	Failed to get a Print Server Monitor parameter value

8 Example Command Sequences

This section illustrates some examples of the command sequences involved in performing certain tasks within the Print Server. Further examples can found in the GIS Help Centre Knowledge Base articles .

8.1 Successful Connection

This example illustrates a successful connection to a server that only allows authorised clients to connect to it.

Connection

← **N,A,xyz**

The key ‘xyz’ is correctly translated into the key ‘abc’

→ **N,R,abc**

← **N,C**

8.2 Unsuccessful Connection

This example illustrates a failed connection to a server that only allows authorised clients to connect to it.

Connection

← **N,A,xyz**

The key ‘xyz’ is incorrectly translated into the key ‘mno’

→ **N,R,mno**

← **N,F**

8.3 Initialise Print Server and Engines Manually

This example illustrates the sequence required to initialise the Print Server, Render Engine and Print Controller directly, using configurations stored in the ‘C:\GIS Print Server 2\Configs’ directory.

→ **S,O,I,C:\GIS Print Server 2\Configs'**

← **A,23,S,O,I,C:\GIS Print Server 2\Configs**

Print Server fully initialises

← **C,23,0**

8.4 Change the System Mode

This example shows how to read back the system mode names, then read the names of the Render Mode and Print Mode linked to one of these System Modes and finally switching to these modes.

→ S,T,N

← A,6,S,T,N

← C,6,0,0;System Mode 1;System Mode 2

→ S,T,I,System Mode 2

← A,7,S,T,I,System Mode 2

← C,7,0,Render Mode 2;Print Mode 2

→ S,T,M,System Mode 2

← A,8,S,T,M,System Mode 2

← C,8,0

→ R,T,M,Render Mode 2

← A,9,R,T,M,Render Mode 2

Render mode with name 'Render Mode 2' applied

← C,9,0

→ P,T,M,Print Mode 2

← A,10,P,T,M,Print Mode 2

Print mode with name 'Print Mode 2' applied

← C,10,0

8.5 Render Bitmap

This example shows how to load the image bitmap 'C:\GIS Print Server 2\Image.bmp', and render it to the locations defined in the Render Engine configuration, followed by '\Print Data\RIP Files.bmp' for each defined colour plane.

→ R,B,C:\GIS Print Server 2\Image.bmp,<Export>\Print Data\RIP Files.bmp

← A,24,R, B,C:\GIS Print Server 2\image.bmp,<Export>\Print Data \RIP Files.bmp

Image fully renders

← C,24,0

8.6 Print Single Item via File

This example shows how to load the VPI document 'C:\GIS Print Server 2\Document.vpi', render it to 'C:\GIS Print Server 2\RIP Files.bmp' and then print three copies of these files.

→ **R,D,C:\GIS Print Server 2\Document.vpi**

← **A,17,R,D,C:\GIS Print Server 2\Document.vpi**

Document fully loads

← **C,17,0**

→ **R,R,C:\GIS Print Server 2\RIP Files.bmp,0**

← **A,18,R,R,C:\GIS Print Server 2\RIP Files.bmp,0**

Rendering fully finishes

← **C,18,0**

→ **P,P,1,C:\GIS Print Server 2\RIP Files.bmp,3**

← **A,19,P,P,1,C:\GIS Print Server 2\RIP Files.bmp,3**

Printing fully finishes

← **C,19,0**

8.7 Print Labels via Queue

This example shows how to render 10 labels from 'C:\GIS Print Server 2\Document.vpi' (starting from label number 32) and print them directly (i.e. without saving the rendered images to file). The point when printing begins depends on the setup of the Print Controller, but it could begin any point after the Print Controller is put into the print queue mode and the Render Manager starts to render.

→ **R,D,C:\GIS Print Server 2\Document.vpi**

← **A,3,R,D,C:\GIS Print Server 2\Document.vpi**

Document fully loads

← **C,3,0**

→ **P,Q,P**

← **A,4,P,Q,P**

← **C,4,0**

→ **R,F,0,32,10**

← A,5,R,F,0,32,10

Only one render command should be sent.

Rendering fully finishes (printing will start during the rendering)

← C,5,0

→ P,Q,E

← A,6,P,Q,E

Printing fully finishes

← C,6,0

8.8 Print on Demand via File

This example shows how to print items on demand i.e. to continue to add items to the queue during the print. This example assumes that all files have been pre-rendered (either by the Render Engine or by an external RIP). The point when printing begins depends on the setup of the Print Controller, but it could begin any point after the first item is added to the Print Controller.

→ P,Q,P

← A,9,P,Q,P

← C,9,0

→ P,Q,A,C:\GIS Print Server 2\RIP Files 1.bmp,2

← A,10,P,Q,A,C:\GIS Print Server 2\RIP Files 1.bmp,2

← C,10,0

Printing starts

→ P,Q,A,C:\GIS Print Server 2\RIP Files 2.bmp,3

← A,11,P,Q,A,C:\GIS Print Server 2\RIP Files 2.bmp,3

← C,11,0

→ P,Q,E

← A,12,P,Q,E

Printing fully finishes (5 images are printed in total)

← C,12,0

8.9 Print on Demand via Memory

This example shows how to render items on demand and print them directly (i.e. without saving the rendered images to file). Some of the document parameters are changed before each render, meaning that each print is different. The point when printing begins depends on the setup of the Print Controller, but it could begin any point after the Print Controller is put into the print queue mode and the Render Manager renders the first item.

→ **R,D,C:\GIS Print Server 2\Document.vpi**

← **A,22,R,D,C:\GIS Print Server 2\Document.vpi**

Document fully loads

← **C,22,0**

→ **P,Q,P**

← **A,23,P,Q,P**

← **C,23,0**

→ **R,RD,S,0**

← **A,24,R,RD,S,0**

← **C,24,0**

→ **R,C,P,GC,I**

← **A,25,R,C,P,GC,I**

The global counter is incremented by one

← **C,25,0**

→ **R,RD,A**

← **A,26,R,RD,A**

The document is rendered and added to the print queue

← **C,26,0**

Printing starts

More documents can be added

→ **R,RD,E**

← **A,27,R,RD,E**

← **C,27,0**

→ **P,Q,E**

← **A,28,P,Q,E**

Printing fully finishes (1 image is printed in total)

← **C,28,0**

8.10 Print on Demand via Image Loading

This example shows how to load pre-rendered images on demand and print them. Some of the Image Loader parameters and the image file path are changed before each image load, meaning that each load is different. The point when printing begins depends on the setup of the Print Controller, but it could begin any point after the Print Controller is put into the print queue mode and the Image Loader loads the first image.

→ P,Q,P

← A,13,P,Q,P

← C,13,0

→ R,LD,S

← A,14,R,LD,S

← C,14,0

→ R,F,L,C:\GIS Print Server 2\RIP Files.bmp

← A,15,R,F,L,C:\GIS Print Server 2\RIP Files.bmp

Image path is changed

← C,15,0

→ R,C,P,SECTION_WIDTH,1000

← A,16,R,C,P,SECTION_WIDTH,1000

Values of the parameters with unique ID SECTION_WIDTH are changed to 1000

← C,16,0

→ R,LD,A

← A,17,R,LD,A

The image is loaded and added to the print queue

← C,17,0

Printing starts

More images can be loaded

→ R,LD,E

← A,18,R,LD,E

← C,18,0

→ P,Q,E

← A,19,P,Q,E

Printing fully finishes (1 image is printed in total)

← C,19,0

8.11 Print Information

This example shows how to ask for all information for a print to be returned, and the messages to expect (the print consists of 2 swathes). The number of position information messages that will be returned depends on the settings in the Print Controller and the images being printed.

→ **<SERVER>0,2,P,P,1,C:\GIS Print Server 2\RIP Files.bmp,1**

← **A,7,P,P,1,C:\GIS Print Server 2\RIP Files.bmp,1**

← **I,7,P**

← **I,7,T,1**

← **I,7,S,Starting Print,13**

← **I,7,S,Initialising For Print,16**

← **I,7,X,0.000,Y,0.000**

← ***More position information messages may be returned***

← **I,7,L,0**

Printing prepares

← **I,7,RTP,2**

← **I,7,S,Printing,12**

← **I,7,T,2**

← **I,7,L,1**

Swathe 1 printing starts

← **I,7,X,130.723,Y,111.987**

← ***More position information messages may be returned***

Swathe 1 printing finishes

← **I,7,L,2**

Swathe 2 printing starts

← **I,7,X,130.723,Y,111.987**

← ***More position information messages may be returned***

Swathe 2 printing finishes

← **I,7,S,Print Finished,15**

← **I,7,S,Ready,1**

← **I,7,L,0**

← **I,7,T,0**

← **C,7,0**

8.12 Register Listener

This example shows how to register a listener to receive information from the Print Controller, and the messages to expect (the print consists of 2 swathes). The number of position information messages that will be returned depends on settings in the Print Controller and the images printed.

→ P,L

← A,7,P,L

← C,7,0

→ P,P,1,C:\GIS Print Server 2\RIP Files.bmp,1

← A,8,P,P,1,C:\GIS Print Server 2\RIP Files.bmp,1

← I,7,P

← I,7,T,1

← I,7,S,Starting Print,13

← I,7,S,Initialising For Print,16

← I,7,X,0.000,Y,0.000

← *More position information messages may be returned*

← I,7,L,0

Printing prepares

← I,7,RTP,2

← I,7,S,Printing,12

← I,7,T,2

← I,7,L,1

Swathe 1 printing starts

→ I,7,X,130.723,Y,111.987

More position information messages may be returned

Swathe 1 printing finishes

← I,7,L,2

Swathe 2 printing starts

← I,7,X,130.723,Y,111.987

← *More position information messages may be returned*

Swathe 2 printing finishes

← I,7,S,Print Finished,15

← I,7,S,Ready,1

← I,7,L,0

← I,7,T,0

← C,8,0

8.13 Change Parameter Using Unique IDs and Paths

This example shows how to change the value of the parameters with unique ID 'Enabled' to 'True', and the value of the parameter 'Enabled' in the node 'Print Manager Board' (only the second child node of 'Print Manager' with this name) to 'False' in the Print Controller.

→ P,C,P,Enabled,True,"Print Manager,Print Line Manager[1],Enabled",False

← A,14,P,C,P,Enabled,True,"Print Manager,

Print Line Manager[1],Enabled",False

The value of parameters with unique IDs 'Enabled' are changed to 'True' and the value of the parameter 'Enabled' in the second node with name'Print Line Manager' is changed to 'False'

← C,14,0

8.14 Abort Print

This example shows how to abort a print. It demonstrates that the abort print command produces a completion message - confirming that the Abort command has been received and the process of aborting the print has begun.

→ P,P,1,C:\GIS Print Server 2\RIP Files.bmp,1

← A,20,P,P,1,C:\GIS Print Server 2\RIP Files.bmp,1

Printing starts

→ P,A

← A,21,P,A

← C,21,0

Abort message received, abort process started

← C,20,0

Completion message from aborted command received

Wait for the completion messages from the aborted command before attempting to send other print commands

Please note that the two completion messages can be received in any order, and any system needs to be set up to handle either way - see **API Client Commands - Print Controller - Print Abort - P,A.pdf** for complete syntax details

8.15 Pause and Resume Print

The Pause function will not stop printing mid-label or swathe, it will pause at the end of a label or swathe.

→ P,P,1,C:\GIS Print Server 2\RIP Files.bmp,1

← A,3,P,P,1,C:\GIS Print Server 2\RIP Files.bmp,1

Printing starts

→ P,U

← A,4,P,U

Printing pauses

→ P,R

← A,5,P,R

Printing resumes

Printing fully finishes

← C,3,0

8.16 Spit

This example shows how to spit at 1400Hz for 2.4 seconds.

→ P,G,T,1400.0,2.4

← A,51,P,G,T,1400.0,2.4

← C,51,0

→ P,GW,F

← A,52,P,GW,F

The spit finishes

← C,52,0

8.17 Print Controller Busy

This example demonstrates a situation where a command will fail because the Print Controller is busy.

→ P,P,1,C:\GIS Print Server 2\RIP Files 1.bmp,1

← A,28,P,P,1,C:\GIS Print Server 2\RIP Files 1.bmp,1

Printing starts

→ P,P,1,C:\GIS Print Server 2\RIP Files 2.bmp,1

← A,29,P,P,1,C:\GIS Print Server 2\RIP Files 2.bmp,1

The Print Controller fails as it is currently busy (it is printing)

← C,29,-201

Printing fully finishes

← C,28,0

9 Source Code

Customers who have purchased TCP/IP support will have access to the TCP/IP software development kit, which contains sample code for developing TCP/IP clients in C++.

Please contact GIS Support if you require further information

10 Contact / Support - Information

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11 Revision History

Rev.	Date	Author	Comment
1.0	19/12/2014	ML	Flare Initial Version
1.1	01/07/2015	ML	Clarified "Start Render Labels" command in sections 6.2 and 9.7
1.2	27/02/2015	ML	Removed all references to Network Controller.
1.3	09/11/2016	NC	Added Print Controller Error Code to section 7
1.4	14/12/2016	NC	Added TCP/IP advice note to Section 2 and Section 5 Print server table; added S,C,SA setup reference to relevant tables; amended cross-references throughout
1.5	23/08/17	NC	Amended Section 5.3 Print Controller Client Command Message Operation Codes to update P, P, 1; P,SM and P,UPG,PFW/HFW commands; updated styling throughout to bring up to current standard
1.6	08/11/17	NC	Amended Section 5.2 Render Engine to include Bitmap image limitation
1.7	23/01/18	NC	Amended Sections 5.3 and 8.14 to clarify P,A command
1.8	18/04/18	NC	Amended Sections 5 and 8 to clarify command information
1.9	25/02/19	NC	Amended Section 5.3 to remove redundant PS,F / PS,NT and PS,RNT commands
1.10	29/03/19	NC	Amended Section 7.4 to include raw pixel data error codes
1.11	17/06/19	NC	Amended Section 5.3 to clarify P,M,P command information
1.12	28/05/20	NC	Amended Sections 6.1 Information Message Codes and 5.5 Printing RIP files
1.13	15/07/20	NC	Amended Section 9 - Source Code to remove C# and VB
1.14	16/12/20	NC	Amended Contact Support details section
1.15	05/05/21	AS	Amended 5.3 Spit Command Message Operation Codes
1.16	12/01/22	AS	Amended section 2.2 Connecting Best Practice