Qi Image Quality Prices

The purpose of this document is to give you, the user, a good understanding of the costs involved with using the Qi Image Quality (QiQ) app and related services. The price structure has been designed with the intent to make QiQ available at a reasonable cost for most purposes—whether you use it only occasionally a few times per year, or use it on a manufacturing floor 8 hours per day 7 days per week.

The next few sections describe the different types of charges for use of QiQ, and the final section gives you examples of the total cost for 4 "real world" usage scenarios. Please note that prices may be subject to change.

Subscriptions, tokens and consultation services

As a user of QiQ you have options to combine purchases of subscriptions, tokens, and consultation services in different ways. For some situations you don't need to make any purchases, while in other situations you may need all three types of purchases. This document will help you understand what you may need, and help you figure out which combination of subscriptions and other purchases is most advantageous for your specific needs, and help you estimate the total cost for your use of QiQ.

Token charges. For <u>most</u> measurements you perform with QiQ there is a charge for the measurements. You purchase *QiQ tokens* (here usually referred to just as "tokens") in advance, and as QiQ analyzes an image and performs image quality measurement it will deduct tokens from your account balance. The details of this, and the price of tokens, are explained later in this document.

There are two exceptions, where QiQ will perform measurements without token charges:

- Most importantly, QiQ can generate images with simulated defects, based on your test charts, and such images can be analyzed without token charge. This means, that if you wish to setup your own test charts with QiQ, define your own measurement scripts and report templates, then <u>you can use simulated images to ensure that your setups work perfectly, without any charges at all</u>.

- There is no charge for analysis of images provided with QiQ for the purpose of tutorials and system performance verification.

Subscriptions. Subscriptions are an optional cost. Purchasing a subscription gives you two advantages:

- Reduced token charges.

- Access to priority support. (We provide some degree of application support for free, but users with an active subscription will be prioritized).

When you purchase tokens there will be no, or only a very small, volume discount. However, if you need to perform many measurements, then an active subscription can give you very large token charge discounts. <u>It is important to understand that the level of discount is determined and applied at the time when QiQ performs an analysis, based on which subscription (if any) is active at that time</u>. That is, having a subscription does not change the price of tokens; and any measurements performed after a subscription has expired, will be charged at the full non-discounted rate.

Consultation services. We strive to make the QiQ software as complete as possible, in order to allow our customers to be as self-sufficient as possible in their use of QiQ. Nevertheless, there may be situations where you need to, or may choose to, use our consultation services (or third party services).

In this context, it should be noted that version 1.0 of QiQ does not support automated creation of the flatbed scanner OECF data file (the Opto-Electronic Conversion Function). The user manual explains how to create the scanner OECF file, but the process is not trivial and requires instruments to perform CIE XYZ measurements. For higher accuracy measurements, each scanner used with QiQ should be characterized with a custom OECF. Depending on the scanner, and on your needs, you may want to repeat the process periodically (e.g. on a monthly or yearly basis) and/or implement a process where measurements performed with a given scanner are periodically checked against a reference (the user manual explains how QiQ's system verification feature can be customized for this purpose).

Contact Qi Analytics LLC directly for consultation services and prices. Purchase of QiQ subscriptions and/or tokens do not entitle you to any general consultation from Qi Analytics LLC.

QiQ subscription prices and advantages

Discounts and prices as of date of this document

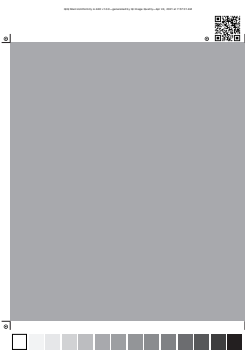| Subscription level	Token charge discount factor	App support	Prices (rounded to nearest 1$)		Duration
None	1x (no discount)	Regular	$	0	N/A
Bronze	5x (5 times more measurements per token)	Regular	$	5	1 week
Silver	10x (10 times more measurements per token)	Priority	$	70	3 months
			$	250	1 year
Gold	50x (50 times more measurements per token)	Priority	$	500	6 months
			$	900	1 year

Token prices and analysis charges

Token prices as of date of this document

Quantity of tokens	Price (rounded to nearest 1$)		Price per token	
100	$	20	$	0.20
1000	$	190	$	0.19
2500	$	450	$	0.18
5000	$	900	$	0.18

To explain the token charges as QiQ performs measurements, let us look at the 4 standard test chart included with QiQ.

QiQ macro-uniformity chart

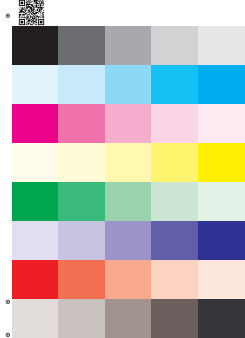| Image area is 21.0 cm by 29.7 cm (A4 size)	Selected measurements	Nominal token charge	Cost depending on subscription level (at $0.20 per token)		
			None	**Silver**	**Gold**
	Only 1 VBS measurement (banding, streaking)	13	$ 2.60	$ 0.26	$ 0.05
	Only 14 color measurements (color and VBS)	80	$ 16.00	$ 1.60	$ 0.32
	All 15 measurements (VBS, color)	81	$ 16.20	$ 1.62	$ 0.32

This chart is designed primarily to assess "macro-uniformity" considering print defects such as streaks and bands. This is assessed on the large gray rectangle with the "VBS" (Visual Bands and Streaks) measurement. There are 14 small gray swatches where color measurements can be used to assess the tone reproduction curve.

Costs with a gold subscription:

- If only the VBS measurement is performed: 5 cents per page.

- If both VBS and 14 color measurements are performed: 32 cents per page.

As can be seen, the first measurement per page is relatively expensive, while additional measurements on the same page at done at lower token charge.
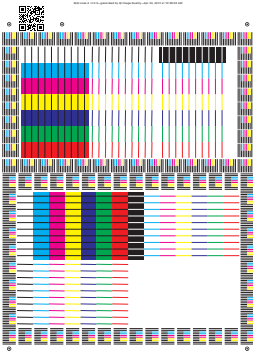
QiQ micro-uniformity chart

Image area is 21.0 cm by 29.7 cm (A4 size)	Selected measurements	Nominal token charge	Cost depending on subscription level (at $0.20 per token)		
			None	Silver	Gold
	Only 40 color measurements	96	$ 19.20	$ 1.92	$ 0.38
	Only 80 noise measurements (40 mottle and 40 graininess)	104	$ 20.80	$ 2.08	$ 0.42
	All 120 measurements (color, mottle, and graininess)	110	$ 22.00	$ 2.20	$ 0.44

This chart is designed primarily to assess "micro-uniformity" considering print defects such as mottle and graininess. This can be assess on each of the 40 color swatches. Optionally, the color measurement can also be applied to the 40 swatches.

Costs with a gold subscription:

- If only 40 mottle measurements are performed: 38 cents per page.

- If only 40 graininess measurements are performed: 38 cents per page.

- If only 40 color measurements are performed: 38 cents per page.

- If 40 mottle and 40 graininess measurements are performed: 42 cents per page.

- If 40 mottle, 40 graininess and 40 color measurements are performed: 44 cents per page.

QiQ lines chart

Image area is 21.0 cm by 29.7 cm (A4 size)	Selected measurements	Nominal token charge	Cost depending on subscription level (at $0.20 per token)		
			None	Silver	Gold
	Only 200 vertical lines measurements	119	$ 23.80	$ 2.38	$ 0.48
	Only 200 horizontal lines measurements	119	$ 23.80	$ 2.38	$ 0.48
	All 400 measurements (positive and negative lines)	140	$ 28.00	$ 2.80	$ 0.56

This chart is designed primarily to assess line quality considering attributes such as width, darkness, raggedness, blur, extraneous marks and more. There are 200 positive, near-vertical lines (some are at a small angle) and 200 positive, near-horizontal lines. In addition there are 20 "negative" lines (which QiQ currently cannot measure). There are also elements to assess color-color registration (which QiQ currently cannot measure).

Costs with a gold subscription:

- If only 200 lines are measured: 48 cents per page.
- If all 400 lines (vertical and negative) are measured: 56 cents per page.

QiQ spots chart

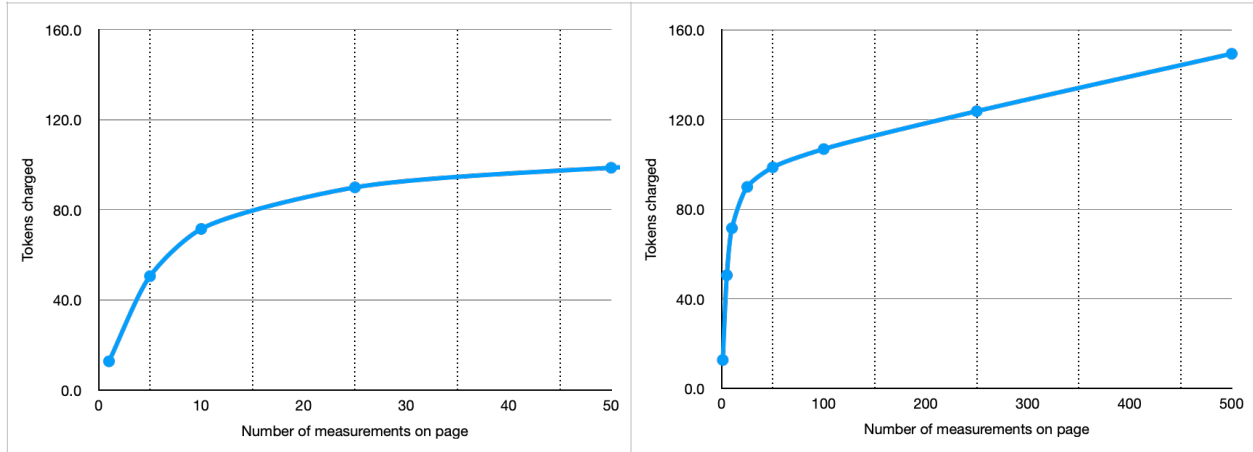| Image area is 21.0 cm by 29.7 cm (A4 size)	Selected measurements	Nominal token charge	Cost depending on subscription level (at $0.20 per token)		
			None	**Silver**	**Gold**
	Only 2 dots measurements	25	$ 5.00	$ 0.50	$ 0.10
	Only 2 voids measurements	25	$ 5.00	$ 0.50	$ 0.10
	All 4 total measurements (dots and voids)	44	$ 8.80	$ 0.88	$ 0.18

This chart is designed to assess dark dots in the two white regions (background) as well as voids in the two black regions.

Costs with a gold subscription:

- If only the 2 dots (or 2 voids) measurements are performed: 10 cents per page.

- If all 4 measurements are performed: 18 cents per page.

Token charges for general charts

As noted above, the first measurement per page is relatively expensive, while additional measurements on the same page at done at lower token charge. The graphs below show how the token charge increases with the number of measurements on an A4 sized page.

Nominal token charges for an A4 size page. The left curve show a detailed view for small number of measurements (up to 50). The right curve is useful for large number of measurements, where each additional measurement is charged roughly 0.1 token.

The nominal (that is, non-discounted) token charge for analysis of a page is calculated based on the image area and the number of measurements performed:

$$T = 0.1N + 63.7A \arctan(0.2N/A)$$

Where N is the number of measurements and A is the image area in units of the A4 paper size.

Examples of total yearly costs

To help you get a sense of the total cost of using QiQ, this section gives examples of the total cost for several hypothetical scenarios. These costs do not include any need for consultation services you may have, e.g. for initial creation of scanner OECF files; such services are optional and may not be necessary depending on the in-house skills and instruments.

The costs given in these scenarios are the costs for one year of use as specified for each example.

For these examples we use a set of four test charts (included with QiQ) as explained above. The various scenarios perform measurements on these charts at different frequency and with different number of measurements on each chart. For these examples we assume all

pages are scanned at the A4 size of 21.0cm by 29.7cm. The total number of measurements for one set of four samples is 1 + 80 + 400 + 4 = 485.

The token charge and corresponding costs per page are as follows:

Charts	Selected measurements	Nominal token charge	Measurement cost with tokens purchased at $0.18 for different subscription levels		
			None	Silver (10x discount)	Gold (50x discount)
Macro-uniformity	VBS (1)	13	$ 2.34	$ 0.23	$ 0.05
Micro-uniformity	Mottle (40) Graininess (40)	104	$ 18.72	$ 1.87	$ 0.37
Lines	Vertical lines (200) Horizontal lines (200)	140	$ 25.20	$ 2.52	$ 0.50
Spots	Dots (2) Voids (2)	44	$ 7.92	$ 0.79	$ 0.16
1 set (all 4 charts)		301	$ 54.18	$ 5.42	$ 1.08

Scenario 1: Development and setup for use on other systems...................................$0

Best option: No subscription & no need for tokens.

You can download and use QiQ free of charge for most or all work related to defining and setting up new test charts and measurements.

Scenario 2: Occasional use ....$217 / year

Here we assume you measure one set of prints each quarter, that is 4 sets per year.

Subscription level	Subscription cost (year)	Measurement cost for 4 sets	Total cost per year
None	$ 0	$ 217	$ 217
Silver	$ 250	$ 22	$ 272
Gold	$ 900	$ 4	$ 904

Best option: No subscription. Yearly cost $217.

Without a subscription there is no discount on the token charge, so each print set of 4 charts requires 301 tokens, for a total of 1204 tokens per year. If tokens are purchased at $0.18 then the total yearly cost is 1204 * $0.18 = $216.72.

Scenario 3: Weekly use ....$532 / year

Here we assume you need to measure one set of prints each week, that is 52 sets per year.

Subscription level	Subscription cost (year)		Measurement cost for 52 sets of 4 charts		Total cost per year	
None	$	0	$	2817	$	2817
Silver	$	250	$	282	$	532
Gold	$	900	$	56	$	956

Best option: Silver subscription. Yearly cost $532.

With a silver subscription there is 10x discount on the token charge, so each print set of 4 charts requires only 30.1 tokens, for a total of 1565.2 tokens per year. If tokens are purchased at $0.18 then the yearly token cost is 1565.2 * $0.18 = $281.74. Adding the silver subscription cost per year, $250, the total yearly cost becomes $532.

Scenario 4: Scanning 10 hours per week (or 10,000 pages/year) ....$3,609 / year

In this scenario we imagine a system connected to a scanner capable of scanning 20 A4 size pages at 1200dpi per hour (e.g. the Epson Perfection V750 Pro). We imagine the scanner is scanning constantly 2 hours per day, 5 days per week[1] for 50 weeks in a year.

During one year, the total number of scanned pages is: 50 * 5 * 2 * 20 = 10,000 pages, and the number of sets of 4 charts is 2,500. The total number of measurements is 2,500 * 485 = 1,212,500.

Subscription level	Subscription cost (year)	Measurement cost for 2,500 sets of 4 charts	Total cost per year
None	$ 0	$ 135450	$ 135450
Silver	$ 250	$ 13545	$ 13795
Gold	$ 900	$ 2709	$ 3609

Best option: Gold subscription. Yearly cost $3,609.

With a gold subscription there is 50x discount on the token charge, so each print set of 4 charts requires only 6.02 tokens, for a total of 15,050 tokens per year. If tokens are purchased at $0.18 then the yearly token cost is 15050 * $0.18 = $2709. Adding the gold subscription cost per year, $900, the total yearly cost becomes $3609.

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[1] Here we are overestimating how many scans can be made per hour since we ignore, among other things, the time required to load the scanner.