

IDEAS & THINKING FROM THE i20 TEAM

BUYING LOGGERS? HERE'S WHAT TO LOOK FOR

This thought piece will be useful to Operations and Procurement teams when purchasing and competitively tendering for loggers.

Either you want to replace existing loggers which aren't as accurate, reliable or didn't last as long as you'd hoped for, or you want to get a better price. Or you want to instrument your network so that you're no longer blind to it. You want loggers right? The first thing to think about is whether it's the loggers that you're really buying. Or are you buying accurate, gap-free fit-for-purpose data, delivered in a timely fashion at a price that's right? Or are you buying visualisation of that data? Or actionable insight from it?

We're going to concentrate on the first of those because it is the foundation stone for doing anything with the data.

Before we consider the specific criteria, there are two broad points to be made:

80:20



You need most of the loggers to meet your needs most of the time. If you try to specify a logger that meets all of your needs all of the time then you'll be paying a price premium needlessly. By all means buy premium loggers for the exceptional cases, but don't buy them for 100% of cases.

Prioritisation of your needs



There are probably some things which you absolutely require a logger to do for you, like not let in water. Maybe there are some things that a logger should do, but you could live without at the right price. And other things which would be nice to have but you don't really care about. Take your list of criteria and mark each of them as Musts, Shoulds and Coulds. If a logger doesn't tick the Must boxes, then it shouldn't be considered. But, be careful to limit your Musts to the absolute minimum; otherwise you may not find anything that meets your criteria! People have a tendency to think that their Shoulds are Musts, and their Coulds are Shoulds so be assiduous.

Here, then, are the 10 things to ask suppliers about and the kind of questions you must, should and could be asking.

1 Usefulness

You need to know what data is gathered and how often.

- What data is available from the logger? (pressure, flow, temp; values and statistical values)
- Does the logger sample or average?
- What data logging frequencies are available?
- What data resolutions are available?
- How does the supplier ensure that data is provided in a timely fashion?

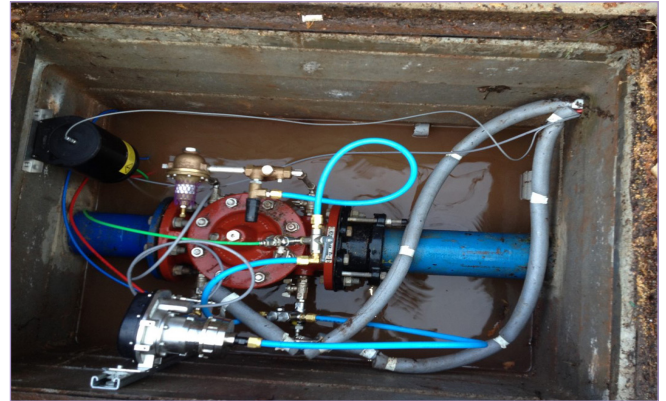
2 Accuracy



Data is of no value if it isn't accurate because you won't be able to rely on the decisions you make.

- Point accuracy (this should be measured over the range of conditions in which the loggers will operate; focus on the conditions that typically prevail, not all conditions that may ever prevail; in the UK that would be 0 – 20 degrees Celsius at 70 - 90% humidity)
- Accuracy over time (this is something you can't measure but you should ask suppliers to comment on)

3 Physical reliability



This is a product which has to survive in an engineer's van then live underground in a reasonably hostile environment for 5 years. You want one that will survive those challenges.

- Packaging (to survive shipping and time in a warehouse or in an engineer's van)
- Drop testing (of course your engineers would never drop one, but...)
- Water ingress, including IP68 certification which should be defined in terms of maximum time spent at a given depth of water which should reasonably reflect what you expect to happen to your loggers 80% of the time.
- Whether a secure fixing mechanism is available (you want your logger to stay fixed in the location in which it is installed rather than floating free in the chamber)
- If there are any components external to the main logger body (if there are, they represent more likely failure points e.g. external transducers)
- Mean time to failure (this is a standard metric for reliability and companies who make hardware products ought to be tracking this metric internally)

4 Service reliability

It isn't only about the logger but getting a complete set of data back from the logger into your hands.

- a. Communications efficacy (how effective is the internal antenna; are there external antenna options that improve reception; can roaming SIMs be used; are there multiple mobile network options – 2G, 3G, 4G?)
- b. Data gaps (do lack of comms automatically result in data gaps?)
- c. Can firmware be updated (at all; does this require a technician to visit the logger; can it be done "over-the-air"?)
- d. Uptime statistics for software services
- e. Upgrades (what process is required to upgrade software?)

If you want to give yourself further assurance on 1 Physical reliability, 2 Accuracy and 3 Service reliability, you may want to add the following:

- a. Development standards (what development standards does the supplier work to?)
- b. Product testing (a description of how a supplier tests its hardware and software products before they are supplied to you)
- c. Quality accreditation

5 Production



There is no point asking about urgent requests when these hardly ever arise. It would be sensible for you to maintain a buffer stock of loggers to accommodate any "emergency".

But you need to know that the supplier can meet your volume requirements.

- a. What capacity does the supplier have? What is current throughput? How could capacity be increased if required?
- b. How are peaks dealt with?
- c. What is the average time from order to availability?
- d. What is the disaster recovery plan?

6 Security

You are responsible for critical national infrastructure. There is no 100% secure system, but there are a number of checks you can make to ensure that the burglars go next door. At each stage of the chain. Can loggers be interfered with? Is there a tamper alarm? How do you connect to them? Is data encrypted in transit? Who can access software?

- a. Security policy
- b. Accreditation
- c. Third party testing

7 Technical support

Once you've bought, are you on your own or is there someone there to help?

- a. What training is available?
- b. What is the scope of support provided?
- c. In what formats?
- d. During what hours?
- e. How are support issues dealt with (prioritised, solved)?
- f. What's the average time to resolve? What is the number of open tickets? What is the aged distribution of those tickets?
- g. What RMA process is employed?

8 Innovation



Is what you're buying going to get better over time?

- a. What product extensions are available that would add greater value?
- b. How much does the supplier spend on R&D?
- c. Does the supplier have a process of continuous improvement?
- d. Can the supplier point to improvements made in the last 6 months?
- e. What is the supplier's roadmap which will directly affect this product/service?

9 Unit cost

How much is it?

- a. Ask for the purchase cost of one pressure logger at various levels of purchasing volumes that you anticipate making. The cost should include such accessories as are necessary for a standard installation, typically bracket and tubing kit.
- b. Variant and accessory costs (e.g. 1P1F, 2P1F, 3P1F; installation cable, external antenna, 30Bar transducers)

10 Lifetime cost



The initial cost is only a portion of the total lifetime cost. This section helps you understand the true cost of ownership.

When you're making comparisons between suppliers, you will find it a lot easier if you fix the timeframe for the life of the product and

ask them to provide the total cost for this timeframe. Loggers, as electronic products with batteries and modems, operating in reasonably harsh conditions, should be expected to last 5 years. So we recommend that you set this as your product lifetime.

- a. Time to fit (and skill level required)
- b. 5 years of software
- c. 5 year warranty (and provide the warranty terms and conditions)
- d. 5 year technical support cost
- e. 5 year mobile data costs (if the supplier provides, which is common in the UK only)
- f. 5 years' battery life under standard operating conditions of 15 minute readings sent 1 times per day with alarm conditions triggered and being communicated periodically (check whether battery would need to be changed in this timeframe, and whether/how battery status is reported remotely)
- g. Training for 5 years including annual installer training and annual software use training
- h. What maintenance of the device would be required over 5 years? (e.g. transducer calibration)

Finally, of course, you need to consider the credit worthiness of the supplier and the prospect of them remaining in business long enough to service your needs. This is a risk assessment and you may want to write in specific contractual conditions that relate to a supplier running into financial difficulties, like placing software in escrow which would be released to you in certain circumstances.

And there you go. Everything you need to make sure you get accurate, gap-free fit-for-purpose data, delivered in a timely fashion at a price that's right.