‘Interface’ Frequently Asked Questions

DAWN Clinical Software is a division of 4S Information Systems Ltd

Guide Version. 1.1 - 10/12/2014 DAWN VERSION 7.9.x
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1. What is an interface?

An interface is a point at which two systems meet and interact to exchange information. In this case, it is the interaction between your healthcare information system and DAWN. For example, a laboratory interface will electronically move laboratory results into your DAWN patient record as they are reported from your laboratory. The diagram in Appendix One has more information on this.

2. Do I need an interface?

We would recommend that you use an interface as it is a safer method of getting data into DAWN as it reduces the chances of transcription error. An interface also reduces the cost for staff time inputting details and makes sure that the patient details are up to date.

3. What is the cost of an interface?

Please call Sales at 4S DAWN on 015395 63091 or e-mail sales@4s-dawn.com for further information.

4. What types of interface are available?

A large number of possible interfaces are available but the three most common interfaces are in the following table.

Interface	Description of interface	Examples
Inbound test results	This interface receives test results from the laboratory system and updates the DAWN system with the information which has been sent.	This interface can update patient's blood test results.
Inbound demographics	This interface receives patient demographics (including name, address, next of kin, contact numbers etc.) from the Patient Administration System and updates the DAWN system with the information which has been sent.	This interface can create new patients, update patient demographics for existing patients, create new GP (PCP) Practices and / or GP (PCP) records and attach them to patient records, update details for existing GP (PCP) Practices.
Inbound admissions / discharges	This interface receives admissions and discharges messages from the Patient Administration System and updates the DAWN system with the information which has been sent.	In anticoagulation systems the interface will update the Treatment Plan status for the patient to show when the patient is admitted to or discharged from hospital. A

		QuickNote can also optionally be created to keep a history of this information. In systems other than anticoagulation (e.g. rheumatology, MS, haematology) this type of interface is normally only used to create QuickNotes in DAWN to show when a patient has had an admission or discharge to hospital
Inbound Appointments	This interface receives appointment messages from the Patient Administration System and updates the DAWN system with the information which has been sent.	In anticoagulation systems the interface will create an appointment for the patient. A QuickNote can also optionally be created. In systems other than anticoagulation (e.g. rheumatology, MS, haematology) this type of interface is normally only used to create QuickNotes in DAWN to show other appointment details.
Inbound Medications	This interface receives medication messages from the Patient Administration System and updates the DAWN system with the information which has been sent.	This interface can update the medications in DAWN which the patient currently receives.
Outbound Summary	This interface sends current visit summary and next test date information out to other systems.	This interface can update hospital / health system patient records.
Outbound Scheduling Interface	This interface sends appointment details from DAWN to other hospital systems.	This interface can send details of new, rescheduled and cancelled appointments.
Billing Outgoing Summary	This interface sends visit information out to other systems.	This interface is useful for feeding billing or costing

		systems.
Outbound Lab Orders	This interface sends details of a patient's new appointment from DAWN to your lab system.	This interface can automatically create an order for a patient's next test.
Outbound Documents	This interface sends documents containing patient details out to other systems.	This interface is useful for feeding document management systems.
Outbound To Call / Voice Automation Systems	This interface sends patient details to call / voice automation systems such as Televox.	This interface is useful to automatically call patients about appointment details (e.g. appointment reminders, missed appointments).

4S DAWN can create outbound interfaces from DAWN in HL7, web services or flat files to any other system as required. Any other interfaces which are required can be considered by 4S DAWN.

5. How are interfaces implemented?

Appendix Two includes the full details of how interfaces are implemented.

6. Who will implement the interface(s)?

A 4S DAWN Interface Developer will implement the interface(s) but will need to work with a contact at the customer's site to carry out some work.

7. What staff resources will I need to enable 4S DAWN to implement an interface?

The table below shows the staff resources that 4S DAWN and the customer will need to enable an interface to be implemented successfully. One person may cover more than one role:

4S DAWN or Customer	**Role**
4S DAWN	Escalation Point – Managing Director of 4S DAWN Clinical Software
	Implementation Manager
	Data Conversion Contact
	Interface Developer
Customer	Project Sponsor/Escalation Point

	Main Project Contact/Project Manager
	Customer Interface Developer / Specialist
	IT/Server/Infrastructure Support
	Trust Integration Engine specialist
	Lab System Manager
	PAS System Manager
	Key User(s) – Admin
	Key User(s) - Clinical
	Main Customer User Acceptance Tester

Should the project become stalled with issues that are unresolvable within the combined project team:

- The customer should contact the 4S Managing Director
- 4S should contact the customer escalation point referred to above

8. How do I test that an interface will bring through the correct results into DAWN?

Thorough testing must be undertaken when implementing an interface to ensure that the correct information is brought into DAWN. Providing two to four weeks of real messages for testing would be ideal. This is because there are sometimes variations in the messages which are sent to DAWN which would only be noticed over time.

4S will construct a test plan for each interface and test this with the customer. 4S will also run tests on the interface internally and these will be reviewed by another 4S Interface Developer. Once the 4S Interface Developer has confirmed that the formal testing plan has completed successfully, the customer should carry out their own user acceptance testing.

9. Who will do the testing?

The 4S Interface Developer and at least one nominated member of staff from the customer's site will do the testing.

10. How long does it take to configure an interface?

For a straight forward interface implementation, with a responsive customer team, it should be possible to complete an interface implementation in approximately four to six weeks. This may be longer if the required resource is not available or if there are unforeseen difficulties, for example, hardware issues / data issues etc.

11. Which messaging formats do 4S DAWN support?

- HL7 messages
- Web Services such as XML files
- Flat files

Appendix Three and Appendix Four contain examples of HL7 messages.

12. How are patient's records matched?

So that test results are stored against the correct patient in DAWN, pre-defined matching criteria are configured within the interface. There are four standard matching rules. The order or number of the matching rules can be configured as required.

1. **National Number and DOB (Date of Birth)**
   An attempt will be made to find a unique patient record in DAWN that has the same national number and date of birth that was sent in the test result message.

2. **Hospital Number (or Medical Record Number) and DOB (Date of Birth)**
   If no unique patient is located in DAWN using rule 1, an attempt will be made to find a unique patient record that has the same hospital number and date of birth that was sent in the test result message.

3. **National Number and Last name**
   If no unique patient is located in DAWN using rule 2, an attempt will be made to find a unique patient record that has the same national number and last name that was sent in the test result message.

4. **Hospital Number (or Medical Record Number) and Last name**
   If no unique patient is located in DAWN using rule 3, an attempt will be made to find a unique patient record that has the same hospital number and last name that was sent in the test result message.

If the patient is located in DAWN using any of the matching rules then the message will be processed as configured in the interface.

13. What happens if a patient's record isn't matched?

If no matching patient is located in DAWN or more than one matching patient is found, then the message will either be discarded or sent to the Hold Monitor as configured in the interface. A DAWN user or system administrator can use the Hold Monitor screen within the DAWN application to view messages that are sent to the holding database and decide whether to delete or reprocess them.

14. How does the data get in and out of DAWN from other systems?

4S use two integration engines to ensure that data gets in and out of DAWN from other systems.

- **Mirth Connect**
  4S DAWN use Mirth Connect to integrate between health information systems and DAWN. The Mirth Connect application will listen for messages sent by different systems and when it receives a message for DAWN, it will perform any additional filtering then create a flat file in the format required by the DAWN Integration Engine.

- **DAWN Integration Engine (DAWN IE)**
  This accepts message files from Mirth Connect and updates the DAWN database. When problems occur, such as duplicate matching patients, the messages are marked as 'On Hold' and they should be reprocessed or deleted by an operator. It is the responsibility of the user to monitor and action the messages that are on hold. This can be achieved by regularly checking the Hold Monitor screen in DAWN.

Appendix One gives an overview of how the interfaces are integrated.

15. How do I know which interface(s) I need?

- Call 4S DAWN who will be happy to advise you on the most suitable interface(s). Our telephone number is 015395 63091

- Check with your own hospital IT department as they may already have some existing interfaces in use. Your IT department may also be able to help identify their requirements for data exchange

16. Can DAWN be integrated with labs outside of the hospital?

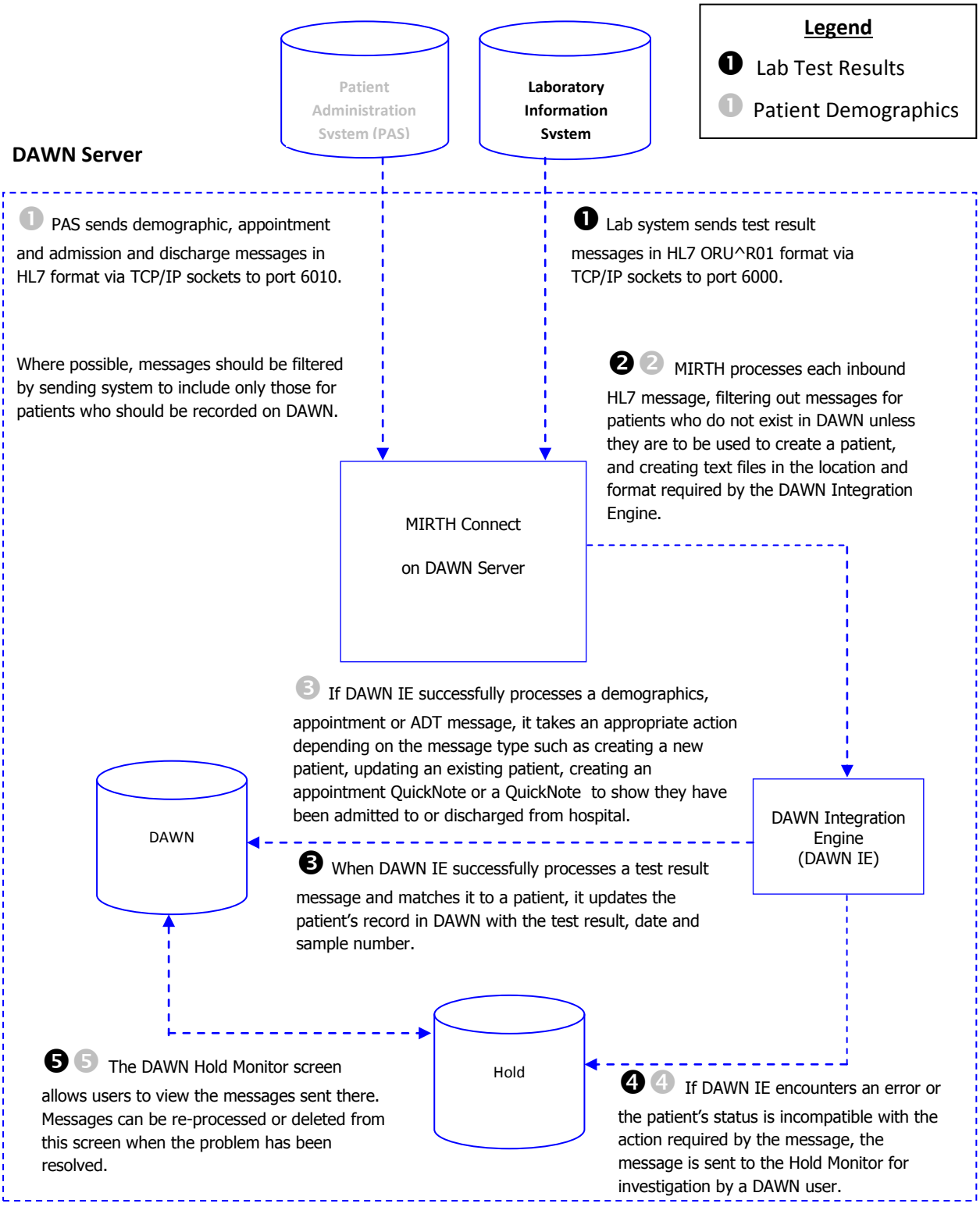
Yes, it is possible to integrate DAWN with external labs.

17. Can DAWN be integrated with multiple labs?

Yes. We can handle the same format messages coming from each lab. We can also handle different format messages coming from each lab but there may be an additional charge for this. An alternative method would be to use the Hospital's Integration Engine to collate the data from multiple labs and send it to DAWN.

Appendix One – Overview of interface processing

The following diagram gives an overview of the available interfaces to the DAWN system. It details the systems that are involved in sending/receiving messages and the flow in which messages are sent and received. Not all of the types of interface included in the diagram have to be ordered or implemented at a site.



Appendix Two – Interface implementation process

Step	Action	Responsibility	Comments
1.	Work is prioritised according to customer need and availability of 4S interface developer resource by discussion between a 4S representative and the customer interface project contact. A start date for the project is agreed.	4S and Customer interface project contact	Before a start date for work on an interface implementation project is agreed the customer will need to confirm that all stakeholders from their side (see step 2) will be available to work on the project as and when needed from that date until completion of the project.
2.	4S Interface Developer will make contact with customer interface contact to determine who the customer key stakeholders in the interface project are. The customer team should include people fulfilling all of the following roles although one person may cover more than one role: - Customer escalation point - Project manager - Interface developer / specialist - Trust Integration Engine specialist (if applicable) - Lab and / or PAS system manager as applicable (familiar with system data and setup) - Server / infrastructure support - Key user(s) – admin - Key user(s) – clinical - User acceptance tester(s)	4S and Customer interface project contact	**NOTE:** Where there are significant delays to a project due to unavailability of customer stakeholders to carry out necessary work or address issues and this cannot be resolved even after discussion with the customer escalation point, then the project may be removed from 4S work in progress. It will then have to be reprioritised alongside all other work and it may be several months before an interface developer becomes available to work on the project again. The 4S Interface Developer will also act as the project manager from the 4S side. The escalation point within 4S DAWN Clinical Software is the Managing Director.

Step	Action	Responsibility	Comments
3.	An interface project kick-off meeting to include all stakeholders is arranged.	4S Interface Developer and / or customer project manager	The objectives of this meeting will be: - Introduce all members of the team from both sides and explain their roles - Brief overview of what the project is meant to achieve, interface types to be implemented etc. - Discussion of any access and hardware requirements / issues - Discussion on message types to be used for each interface type - Discussion of specific configuration options and processing required (options available described later in this document) and any additional requirements - Discussion about test messages to be sent and any issues - Discussion about timescales for each stage and agreement of a project plan and dates for regular review meetings Sample messages provided by the customer before the meeting where this is possible can aid discussion of requirements at the meeting.
4.	Creation of a Project Definition Document, and project plan.	4S Interface Developer	These documents will be sent to the project team. The project plan document will be updated throughout the project with any changes to timescales, actions assigned, risks and issues arising and details of any change requests. It will be used as the basis of the regular project review meetings.
5.	Interface safety documentation provided to customer project team.	4S Interface Developer	The customer team need to review the Interface safety documentation and business processes will need to be amended to incorporate any applicable safety recommendations before the interface go-live.

Step	Action	Responsibility	Comments
6.	Access to customer test server is provided to 4S if this is not already available. This server will need a method for 4S to transfer files on and off it to allow the interface components to be installed and configuration files to be worked on. This would ideally be access to our ftp server from the test server.	Customer server / infrastructure support	
7.	Creation of an Interface Overview Document which details all of the customer specific configuration options and processing agreed.	4S Interface Developer	This document will be sent to the project team for review and discussion. There may be a cycle of meetings, changes discussed and updates to the document. This process will go on in parallel with steps 8 - 10 below.
8.	Installation of interface software components on to the test server and configuration of interfaces based on requirements discussed at kick-off meeting and any subsequent meetings.	4S Interface Developer	
9.	Customer sends through some sample test messages	Customer Interface Developer / Specialist	Ideally two to four weeks of messages.
10.	Sample test messages used for testing	4S Interface Developer Customer team	The 4S Interface Developer will do some initial testing to ensure that the interface configuration is working. Customer users should then look at the sample data loaded via the interface to see if there are any issues with the configuration options discussed and agreed. Any issues identified will feed into the work described in step 7 above. There will be a cycle round steps 7 – 10 with discussion meetings as necessary until the required configuration and processing is agreed and completed.

Step	Action	Responsibility	Comments
11.	Sign-off of completed Interface Overview Document	Customer team	Once the interface configuration and processing requirements have been signed off, any subsequent functionality changes requested may incur additional charges depending on amount of re-work required.
12.	Creation of Test Plans for the interfaces	4S Interface Developer	
13.	4S internal review of interface documentation, configuration and test plans	4S	
14.	Test plans sent to customer	4S Interface Developer Sign-off by customer team	The customer may choose to use the test plans provided by 4S for their user acceptance testing or to create their own test plans.
15.	Formal 4S interface testing	4S Interface Developer (results reviewed internally)	

Step	Action	Responsibility	Comments
16.	User acceptance testing	Customer User Acceptance Testers	The customer should carry out their own user acceptance testing of the interfaces once the 4S Interface Developer confirms that their formal testing has been completed successfully. This user acceptance testing should be full end-to-end testing generating 'real' live format messages from the PAS or Lab system through to DAWN. Any issues found in user acceptance testing should be raised with the 4S Interface Developer as soon as they are found and these will be discussed and a resolution agreed. The resolution may be a fix to the problem found, in which case previous steps will need to be re-done as necessary, or the resolution may involve agreement of a workaround and / or future development after go-live depending on the issue found. **NOTE:** This user acceptance testing should be completed within 2 weeks of the handover to the customer by the 4S Interface Developer. The customer will be required to confirm successful completion of their user acceptance testing to the 4S Interface Developer before the interfaces can go live.
17.	Implementation on live server	4S Interface Developer	This step includes a number of individual tasks and will require discussion and agreement between the 4S Interface Developer and the customer team.

Appendix Three – Example HL7 Message – Single Test Result

MSH|^~\&|LAB|LAB|DawnAC|DawnAC|20120925083704||ORU^R01|00000165|P|2.3
PID|||0726946||JONES^FREDERICK||19420525|M||U|4 THE SQUARE^^MILNTHORPE^CUMBRIA^LA7 7QJ||015395 63091|||||02188092|906885221
PV1|1|O|D-RAD^^^^^^^^C1||02188092||UNKNO^UNKNOWN DOCTOR^PROVIDER^^^^^9999|||||||||DICKM^DICKSON^M^^^^^0612||||||||||||
||||||||||RH|||||201209160930|201209162359
OBR|1|||PT^PT-INR|||201209250833|||CJS||||201209250836||^^||BLT||||201209250836||HEMC|F||^^^20120925^^R|D-AMS||||CJS||CJS
OBX|1|NM|INR^INR||1.5||0.9-1.3|H|||F|||201209250836|C|CJS|201209250837

HL7 messages are split into segments. The segments contain fields. The fields are separated using the pipe (|) symbol. Each HL7 message is of a particular message type. The message type indicates what health-related information is being provided in the message. The message type is normally contained in the 9th field of the MSH segment. In the example above, the 9th field in the MSH segment is ORU^R01 which is an observation result.

The segments in the example above are as follows:

MSH	Message Header
PID	Patient Information
PV1	Patient Visit
OBR	Observation Request
OBX	Observation Result

Appendix Four – Example HL7 Message – Multiple Test Results

MSH|^~\&|ILAB|LAB|ICM|RWE|20130529122902||ORU^R01|34858889|P|2.4|34858889
PID|1||4925774603^^^NHS^NHS~S2123054^^^AX^UNITNO||TESTPATIENT^DAWN^H||195309260000|M|||Address Line 1^Address Line 2^Town^^POSTCODE||01999 888555|||4|1A|||||A|||||||||||||||
PV1|1|I|R33^^^^^^^^Ward 33 Short Stay Unit||||WAL17|||300|||||||N|RWE_HISS_109825228|||||||||||||||||||||||||||||||
ORC|SC|001CBCBVP^ICM|6297137021HFBC^ILAB|001HQ6213^ILAB|CM||||||C6027552^Jones LR Dr (Medicine)|||||||||||||
OBR||001CBCBVP^ICM|6297137021HFBC^ILAB|FBC^Full blood count^H|||201305291017|||||||201305291208|S|C6027552^Jones LR Dr (Medicine)||||CP133457B|||||F||||||20130529101801|Computer|
NTE||LTGC| ~
OBX|1|NM|WBC^White Cell Count >>>||6.8|x10\S\9/L|4.0 - 11.0|""|||F|||201305291228|||CELL|
OBX|2|NM|RBC^Red Blood Count||4.09|x10\S\12/L|4.50 - 6.50|L|||F|||201305291228|||CELL|
OBX|3|NM|HGB^Haemoglobin (New Units)>>>||111|g/L|130 - 180|L|||F|||201305291228|||MAN|
OBX|4|NM|HCT^Haematocrit||0.324|L/L|0.400 - 0.540|L|||F|||201305291228|||CELL|
OBX|5|NM|MCV^Mean Cell Volume||79|fL|80.0 - 99.0|L|||F|||201305291228|||CELL|
OBX|6|NM|MCH^Mean Cell Haemoglobin||27.2|pg|27.0 - 32.0|""|||F|||201305291228|||CELL|
OBX|7|NM|PLT^Platelet Count >>>||385|x10\S\9/L|140 - 400|""|||F|||201305291228|||CELL|
OBX|8|NM|NEUAB^Neutrophil Count||5.54|x10\S\9/L|1.50 - 7.50|""|||F|||201305291228|||CELL|
OBX|9|NM|TLYMAB^Total Lymphocyte Count||0.74|x10\S\9/L|1.00 - 4.00|L|||F|||201305291228|||CELL|
OBX|10|NM|MONAB^Monocyte Count||0.45|x10\S\9/L|0.20 - 0.80|""|||F|||201305291228|||CELL|
OBX|11|NM|EOSAB^Eosinophil Count||0.09|x10\S\9/L|0.04 - 0.40|""|||F|||201305291228|||CELL|
OBX|12|NM|BASAB^Basophil Count||0.01|x10\S\9/L|0.02 - 0.10|L|||F|||201305291228|||CELL|
OBX|13|NM|NRBCAD^Nucleated Red Blood Cells||<0.20|x10\S\9/L|0.00 - 0.20|""|||F|||201305291228|||CELL|