



# **Introduction to Developing Software for HM Revenue & Customs (HMRC) Forms and Returns**

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## Introduction to the Software Developer Support Team

We are responsible for providing support services to Software Developers and we will be your main point of contact during the development and testing of your product. Our role includes:

- Contributing to and coordinating the release of all published technical information to support the development of your software;
- The provision, management and enhancement of the testing environment and keeping you informed Test service availability;
- Providing you with the appropriate testing credentials;
- Supporting you throughout your development, giving appropriate feedback and advice;
- Supporting you through the Recognition process and evaluating your software;
- Supporting PAYE End of Year (EOY) Software Developers through the Accreditation process and evaluating their payroll software against the Payroll Standard and the Pensioner Payroll Standard;
- Providing you with payroll test data to check your software is working in line with the latest specifications and guidance;
- Consulting with you on new services and proposed changes to existing services;
- Providing you with statistics for the evaluation of your product(s);
- Representing your views, issues and requirements across HMRC; and
- Organising and hosting developer forums and technical workshops to deliver key development information.

## Technical Documentation

You can find the technical information to support the development of your software on our website. These documents are aimed at Software Developers only and not at employers or other individuals who may wish to use HMRC online services.

Go direct to [Online Services: practitioners \(software developers\)](#)

## Message Implementation Guidelines

The Message Implementation Guides (MIGs) are the technical specifications for the Electronic Data Interchange (EDI) messages transmitted between trading partners and HMRC. There is a separate MIG for each message type.

Each MIG will detail the record layout for messages in both EDIFACT and GFF (Generic Flat File) formats. The business validation rules for each message are included within the MIGs

Go direct to [PAYE Online for Employers: technical specifications EDI](#)

## Internet Technical Packs

The contents of the technical packs are frequently updated and we will advise you by email when these are updated but please check the website regularly to ensure that you are working with the most up to date version. Where possible the version numbers and version dates are shown on each document.

The majority of technical packs published will include common items essential to producing a working application that communicates successfully with HMRC. A brief description of these documents follows:

## Government Gateway Submission Protocol Document

The Government Gateway handles the requests and responses for most of HMRC Services. **It is important that you read the Government Gateway Submission Protocol Document before you start developing your product.**

Go direct to [Government Gateway Submission Protocol Document](#)

There is a sample application available that implements the Document Submission Protocol, for more information on this application contact SDS Team

## XML Schema

XML (eXtensible Markup Language) is HMRC's language of choice for all submissions made to its services. The schema sets out the format, structure and data types that HMRC accepts for a particular service. There may be a schema in the technical pack you are working to and it is important that you understand the schema and the validation it enforces.

Although we provide advice on working with our schemas, we can not provide you with training and advice on understanding XML and XML schema. More information on XML and schema can be found at [www.w3.org/XML/Schema](http://www.w3.org/XML/Schema)

## Business Rules Document

Most technical packs (excluding SA, PAYE MOV and EMCS) include a business rules document. These business rules are a human readable summary of all fields to clarify the rules and provide additional information where cross-field validation applies.

## Rules & Interface Management (RIM)

A manual process has been historically used to capture business validation rule requirements and generate and manage artefacts to be used both by humans and software components in the validation of online transactions. HMRC have introduced the RIM service which automates the process and this is being rolled out to new and existing services. When RIM is introduced to a service we will assess developer understanding and deliver a technical workshop if needed. This automation has the benefit of reducing costs and business rule ambiguity and increases consistency across services and better re-use of components and rules.

The first stage in the service is the capture of the defined requirements. Once fully captured, the requirements are fed into the RIM components and rules repository which automates the output of the relevant technical artefacts. These artefacts include the schema, specification document, valid samples and the schematron which is a machine readable version of the combined business rules.

Schematron Resources

<http://www.xfront.com/schematron/overview.html>

<http://www.schematron.com>

The RIM service is now in use for SA, PAYE MOV and EMCS.

## How to Use the Test Services Document

The How to Use the Test Services document will help you understand how to go about testing your application and it includes the URLs for our test services and other useful information.

## The Generic IRmark (or HMRCmark) Technical Pack

Legislation lays the burden of proof on the submitter of a form or return when they dispute that the form received by HMRC is not the same as the one they sent. So a mechanism is provided to help the submitter prove this. This mechanism is the generic IRmark or HMRCmark (pronounced I-R-mark or H-M-R-C-mark) and Digital receipt service for online Internet submissions. It consists of:

- A client-side generation and server side validation at HMRC of a secure hash (IRmark or HMRCmark)
- The generation of a digital receipt from HMRC that is returned to the submitter which:
  - Confirms acceptance of the submission;
  - Confirms the validity of the submitted IRmark or HMRCmark string;
  - Contains HMRC's digital certificate so that the signature can be verified by a third party; and
  - Contains a service-specific message.

Further information can be found in the [Generic IRmark Technical Pack](#).

## **Quality Standard Specification – EOY and P38A**

The Quality Standard Specification document defines the Quality Standard expected from employers or their intermediaries when filing their Annual Return (P35), End of Year Summary (P14) and Employer Supplementary Return (P38A) over the Internet and EDI. The specification incorporates the Business Validation Rules previously published as part of the Internet technical pack for software developers and the EDI Message Implementation Guidelines (MIGs).

Further information can be found in the [Online Services Quality Standard Validation Specifications](#)

## About The Internet Test Services

To assist in your development we strongly recommend that you use a commercially available XML Editing and Validation tool.

Development of your online application is in two stages:

- The first is developing the XML in line with the relevant schema and business rules
- The second stage is submitting the file to the Government Gateway.

When you are ready to test your product, there are two separate test services available to mirror the 'Live' service. These are TPVS and VSIPS. For some services there are additional standalone testing tools available, these are the Validation Tool (or the 'Desktop Checker') and the Local Test Service.

### Third Party Validation Service (TPVS)

TPVS allows software developers to validate the 'Form' or 'Body' of their test XML submission against the schema and the business rules or Quality Standard.

You must ensure that any XML documents you are submitting have been prepared using the most up to date schema and relate to the latest tax year supported by the TPVS service. Responses will be returned based on the outcome of your submission indicating if the submission has passed or failed validation. Remember that if you send submissions direct to the TPVS site, the service will not perform a full validation on the GovTalkHeader.

Your XML must contain the unique credentials supplied to you upon registering with the SDST.

The TPVS is only for use by Software Developers. You must not let your customers have access to your credentials.

### Third Party Validation Service (TPVS) 2 for VAT, ECSL and ATWD

TPVS 2 (TPVS direct) is the test service used by software developers to validate the 'Form' or 'Body' of their test XML submission against the VAT ECSL and ATWD schema and the business rules.

### Vendor Single Integrated Proving Service (VSIPS)

VSIPS allows software developers to submit test XML through the Government Gateway Test Site to the HMRC TPVS site, mirroring the 'live' Internet service which your customers will use.

When you submit XML to the Government Gateway a "conversation" should take place between your application and the Government Gateway. This is covered in detail in the Government Gateway Submission Protocol Document.

VSIPS initially validates the GovTalk Header within your XML against the GovTalk schema. The test submission is then automatically routed to the TPVS service where the <Body> of the XML submission will be validated against the schema and the business rules or Quality Standard applied. Response messages will be returned based upon the outcome.

Your test XML must conform to the relevant schema and business rules for the tax year being developed. Your XML must also contain the unique credentials supplied to you on registering with the SDST.

NB. You must use this test service if you wish to apply for Recognition for Internet enabled Software.

Submissions to VSIPS are made to the following URL:

<https://secure.dev.gateway.gov.uk/submission>

## **Offline Testing Tools**

### **Validation Tool (Desktop checker) – PAYE EOY (P14, P35, and P38A) and CIS only**

The Validation Tool allows users to select a file, run the rules against that XML file and produce the same XML result as it would in live, including all errors found. Developers can self serve to check the standard of their products locally, without having to access the TPVS service. The Desktop Checker **must** be used during PAYE EOY development work as it is a supplement to the TPVS and VSIPS services.

### **Local Test Service (LTS) – PAYE MOV, SA and EMCS only**

The LTS is an additional tool to support the testing of your software products and additional information is given in technical packs for services that support it. The LTS allows users to select a file, run the rules against that XML file and produce the same XML result as it would in live, including all errors found. Developers can self serve to check the standard of their products locally, without having to access the TPVS service.

## **Technical Standards**

It is important to note that the HMRC XML Web Service follows the World Wide Web Consortium (W3C) definition of a system that enables clients and servers to communicate using XML messages that follow the SOAP standard. Commonly associated with a web service is a machine readable description of the operations supported by the server in the form of a WSDL (Web Services Description Language).

The Electronic Data Interchange (EDI) service follows the United Nations rules for Electronic Data Interchange for Administration, Commerce and Transport (EDIFACT)

## Using the Test Services

To use the test services you must first register to obtain the necessary credentials from us by sending us the following information by email to [sdsteam@hmrc.gsi.gov.uk](mailto:sdsteam@hmrc.gsi.gov.uk)

- Company name
- Contact name
- Address and postcode
- Telephone number
- Email address
- Website address (where appropriate)
- The service(s) you will be developing software for

We may use your email address to send you additional information on service availability, updates to technical information and to invite you to a Software Developer forum. These forums are your opportunity to hear the latest news/developments in a particular area and to discuss these further with representatives from HMRC and technical partners.

If you do not wish to receive these email bulletins or if your email address changes, please let us know.

If you are developing software for VAT, ECSL or ATWD you will also need to supply your static IP address which you should obtain from your Internet Service Provider.

[Register to use the test services](#)

### Ready to Test (TPVS and VSIPS)

When you are ready to test your product, you should arrange to upload your XML messages to the test sites.

In order for us to provide you with feedback and support, you **must** include your 4 digit Vendor ID within the <URI> element in your XML messages. You should also use the <Product> and <Version> tags to differentiate between different products.

### EDI Testing

HMRC has test services for Software Developers who want to test their system development, and for employers and payroll bureaux to test extracts from their payroll systems.

All users of the test system must register with HMRC before submitting any test files and all test files must contain the "test flag" in the header record.

Details of the EDI test service are in the MIGs.

## HMRC Software Recognition

Once you have successfully completed your own testing you can apply to the Software Developer Support Team for HMRC Recognition for your product. Application for recognition is optional but recommended as HMRC will test the ability of your software product to send a valid form or return over the Internet. If successful your product details will be published on the Internet Filing Enabled Software web pages for Internet software or the EDI enabled software web pages on the HMRC website.

The internet process involves the submission of a number of 'Recognition' test cases, provided by the Software Developers Support Team that you must submit successfully to VSIPS. You will also need to send XML output from your product for these test cases to the Software Developers Support Team.

Each technical pack or MIG provides full details of the Recognition process.

Go to [Internet Filing Enabled Software](#)

Go to [PAYE Online for Employers: EDI software and forms](#)

## HMRC Accreditation of Payroll Software

### HMRC Payroll Standard

The Payroll Standard is a list of payroll requirements that HMRC use to test commercial payroll products and award accreditation. Accredited payroll products or services can display the accreditation logo on their marketing material.

The logo helps employers to identify payroll software products or services with the essential features necessary to calculate PAYE; NICs; Statutory Payments; and to perform a range of other payroll functions.



|                   |                                   |  |
|-------------------|-----------------------------------|--|
| Optional Features | 2 weekly 4 weekly pay frequencies |  |
|                   | Directors National Insurance      |  |
|                   | Contracted-out Pension Deductions |  |

### HMRC Pensioner Payroll Standard

The Pensioner Payroll Standard is a list of pension payroll requirements that HMRC use to test commercial payroll products and award accreditation. Accredited payroll products or services can display the accreditation logo on their marketing material.

The logo helps pension payers to identify payroll software products or services with the essential features necessary to calculate PAYE and to perform a range of other payroll functions.



For more information go to [Online Services: Payroll Standard and Pensioner Payroll Standard Accreditation Scheme](#)

### Benefits of accreditation

HMRC actively promotes the Payroll Standard/Pensioner Payroll Standard and accredited software to employers and pension payers by:

- listing accredited software on the HMRC website;
- including information about the standards and accreditation scheme in the Employer Pack; and
- providing information about the standards and accreditation scheme at many events throughout the country.

### Payroll Test Data

We also provide payroll test data which covers Tax, National Insurance, Statutory Payments, data validation and a range of other payroll functions. This test data has two purposes:

- For payroll developers to assess whether their software meets the requirements of the HMRC Payroll Standard and/or Pensioner Payroll Standard BEFORE applying for the accreditation scheme.
- For any payroll developer to use in their own internal testing routines.

Go to [Online Services: Payroll Test Data](#)

## Our Service Commitment

### Telephone and Email Support

We will always aim to respond to your query in full within 24 hours. However, there may be occasions where we need to seek guidance from our business or IT partners in answering your query.

On these occasions we will acknowledge your email and telephone query within 2 days and we will aim to provide a full response within 5 working days. Where we are unable to respond in full within 5 working days, we will contact you again and we will send you updates on progress with your query every 14 days or as agreed with you.

### Test Service Support

The test services are supported Monday to Friday between 09:00 and 17:00.

We will occasionally close the test and live services to enable us to update existing services and introduce new services. Where possible these updates will take place outside of normal working hours. We will keep you informed of the availability of our services through our Service availability pages.

Go to [Service availability \(Test & Live\) & news for Software Developers](#)

### HMRC Recognition for your product

We will always aim to complete Recognition applications within 10 working days of receipt of your documentation.

## Terms and Conditions

1. The test services are only for use by Software Developers. You must not let your customers have access to the testing credentials supplied to you upon registering with the SDST.
2. Your test XML must contain the unique testing credentials.
3. Your test XML must conform to the most up to date schema and business rules and must relate to the latest tax year supported by the test services.

## Our Contact Details

The Software Developer Support Team can be contacted on:

Tel: 01274 534666

Email: [sdsteam@hmrc.gsi.gov.uk](mailto:sdsteam@hmrc.gsi.gov.uk)

Opening hours: Monday to Friday 09:00 - 17:00  
(Closed Bank Holidays)

Please note that general customer and user enquiries relating to the live Internet services should be directed to the Online Services Helpdesk:

Tel: 0845 60 55 999

Overseas Caller Tel: +44 161 930 8445

Minicom: 0845 366 7805

Fax: 0845 366 7828

Email: [helpdesk@ir-efile.gov.uk](mailto:helpdesk@ir-efile.gov.uk)

Opening hours: Monday to Friday 08:00am - 20:00pm

Weekends and Bank Holidays 10:00am - 18:00pm

(Closed Christmas Day, Boxing Day and New Years Day)

The Payroll Support Team can be contacted on:

Payroll Standard Helpline Tel: 0845 91 59146

Accreditation Scheme Manager Tel: 0191 22 54777

Email: [Payroll Support Team](#)

## Downloads and Links

### Complaints Process

Go to <http://www.hmrc.gov.uk/dealingwith/complain.htm>

### Disclaimer

Go to <http://www.hmrc.gov.uk/terms/>