omnia
Cardiopulmonary Diagnostic Suite

One integrated solution for effective Lung Function, Metabolic and Body Composition data management

COSMED
The Metabolic Company

- Intuitive, immediate, touchscreen-ready user interface
- Compatible with Windows 10
- Designed according to latest scientific standards
- Advanced interpretation with graphic tools for a quick and accurate test assessment
- Available in Stand-alone, Local and Wide Area Network versions
- Built over SQL database (Express or Standard)
- Integration with HMR via GDT and HL7
- Compliance to access and security standards (HIPAA)

OMNIA is the new software platform developed by COSMED designed for data management, interpretation and reporting of all tests performed with the entire COSMED product range, from spirometry to lung function equipment and from metabolic to body composition assessment.

OMNIA, entirely designed and developed by COSMED, provides an innovative and user-friendly interface (touch-screen ready) that allows operators to navigate and access main features and testing almost without any training in a multi-language environment.

OMNIA is easy to setup, and, thanks to its intuitive environment, it is extremely easy to learn. OMNIA is available in both Stand-alone and Network version, a fully featured software with Server/Client architecture.

Key Features

- **EASY TO USE**. Beautifully designed GUI makes complex operations easy to perform, test and interpret.
- **VERSATILE**. Designed for clinical and research environments.

- **INTEGRATED**. With HL7 connector OMNIA brings productivity and efficiency of the Lab, while integrating it with your Hospital Information System.
- **YOU OWN YOUR DATA**. OMNIA is based on either Express or Standard **SQL database** to store data securely. SQL language ensures that your database is continuously improved, updated and well maintained.

- **MODULAR AND SCALABLE**. OMNIA is a modular solution that allows you to upgrade at any time according to your specific needs.
- **LONG TERM INVESTMENT**. OMNIA design, based over the most recent generation of Microsoft programming language, makes easy to follow the evolution of the Microsoft Operative System for the years to come.
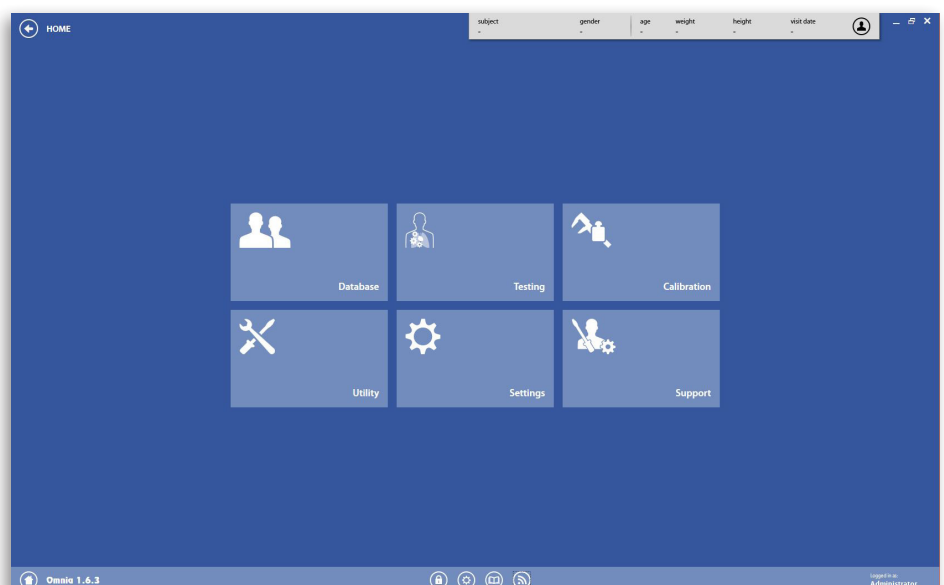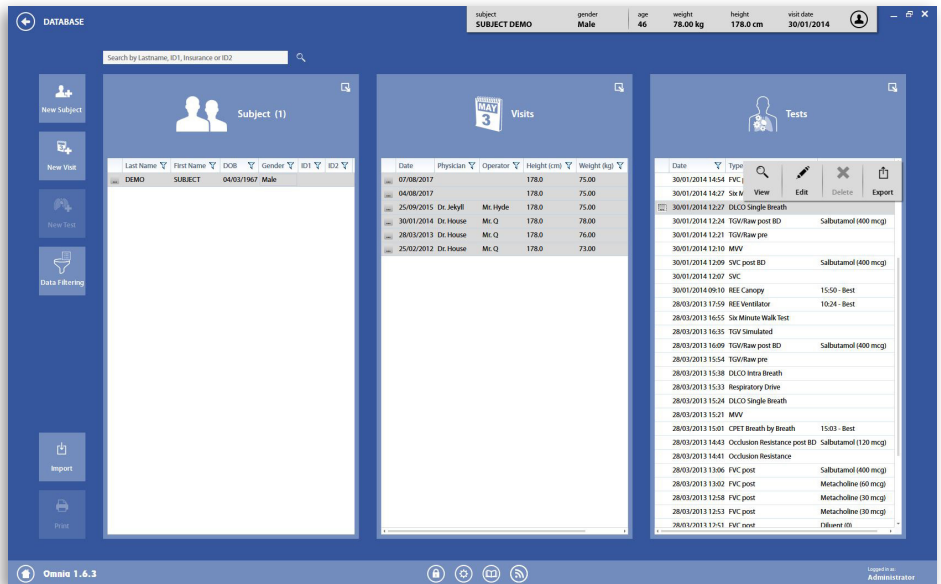

OMNIA Home page. Click on the big tiles to start navigating into the software
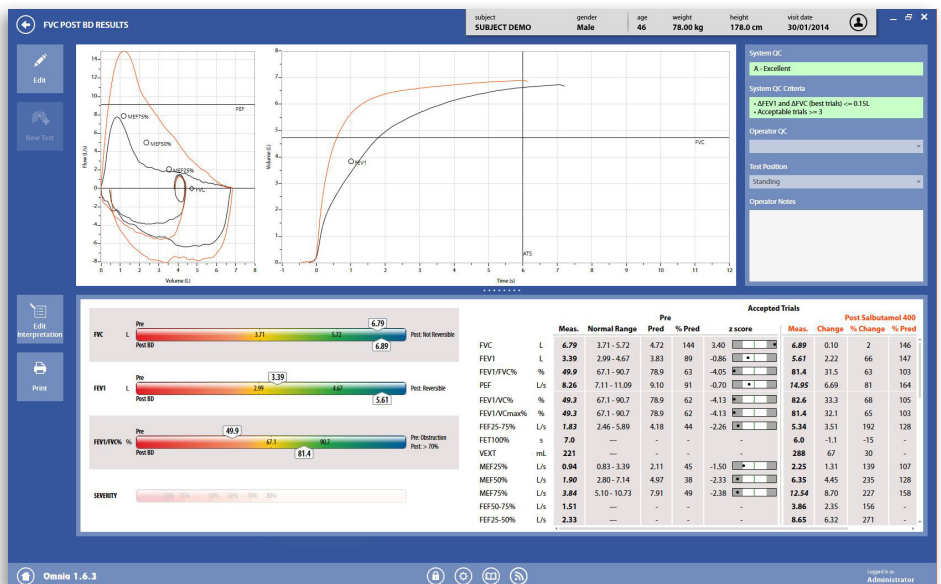
Graphic User Interface (GUI)

OMNIA uses a contemporary, simple and ergonomic user interface designed for touch-screen with intuitive workflow and hierarchy.

The interface has been designed according to the most recent design guidelines for Graphic User Interface and allows users to navigate and access main features and testing, almost without any training.

- Tests, calibrations and options made available on license information and on single user configuration settings.

- Big and easy-to-learn tiles make navigation quick (Home, Back etc.). Additional icons make access to most common commands extremely simple (Settings, etc.).

- The **Device Manager** tool allows users to easily setup multiple devices to be used with a single installation of OMNIA. A single license allows to use multiple devices either in a single PC or in a large network environment.

- Customized report function allows to user-define reports (select parameters, select fields/column, hide/show plots, additional test information, customize report header, and more...)

- Keyboard shortcuts to facilitate and speed up navigation (F5, F6, ...)

- OMNIA supports and runs in numerous languages (including special character sets): English, Italian, French, German, Spanish, Dutch, Russian, Chinese (simplified & traditional), Portuguese, Turkish, Greek, Romanian, Korean, Czech, Polish, Norwegian, Hebrew (interpretation only).

Database Management

OMNIA is based on either **Express** or **Standard SQL** database to store unlimited data securely and guaranteeing lifetime data ownership.

The database consists of a Subject, which contains an unlimited number of Visits. Each visit card contains a maximum of one test for each test type (i.e. FVC, SVC, MVV, etc.), while each single test is the result of a number of trials performed during the current visit. This Database structure ensures maximum data flexibility whether the system is used for clinical or research purposes.

Query (Search Engine)

All information can be easily found via the powerful search engine (Advanced Custom Query), which allows queries on type of Tests, Date of visit and Company fields.

OMNIA database management

OMNIA Spirometry results

OMNIA CPET breath by breath results in a 9 panel plot format

Safety (Backup/restore)

Backup and restore function allows the operator to avoid damage or loss of data. The software displays a back-up warning message every 30 days.

Data Export/Import

The Database allows to input manually "offline" tests, performed anytime in the past, containing a set of main parameters for each specific test. OMNIA allows to Import/Export data on the following file formats:

- **XML** (for single test, single visit or single subject) Import/Export
- **PDF** (per single test) Export only
- **GDT** (per single test) Import/Export (optional)
- **XLSX** (per single CPET test only) Export only

If you own a COSMED product provided with previous software generation (PFTSuite, CPETSuite), you can convert the old Database in OMNIA via the software tool **DBConverter** available in the OMNIA Installation package.

Data can also be imported from an external database providing that the database is not encrypted and in compliance with a standard CSV file formatted according to COSMED specifications (Competitive Data Import option required).

Batch Printing

OMNIA allows to print any single or a batch of either all or a selection of tests. Batch printing can be performed providing a user defined selection criteria (type of tests, date of visit and company fields, etc.) via the Advanced Custom Query function.

Privacy

OMNIA complies to EU, US and International regulations to manage privacy and security of health information (US **HipAA**, ISO 27799:2008, EU 95/46/CE and EU 2002/58/CE) and uses standard cryptography provided by Microsoft SQL Server to protect data. OMNIA User Management is compatible with Microsoft Active Directory.

Configuration at a glance

Each OMNIA workstation can be configured with different test modules and options and it can be easily upgraded at any time.

A single OMNIA workstation can be connected to several COSMED equipment featuring:

- Spirometry
- Pulmonary Function Testing
- Cardio-Pulmonary Exercise Test
- Indirect Calorimetry
- Body Composition
- Stress ECGs
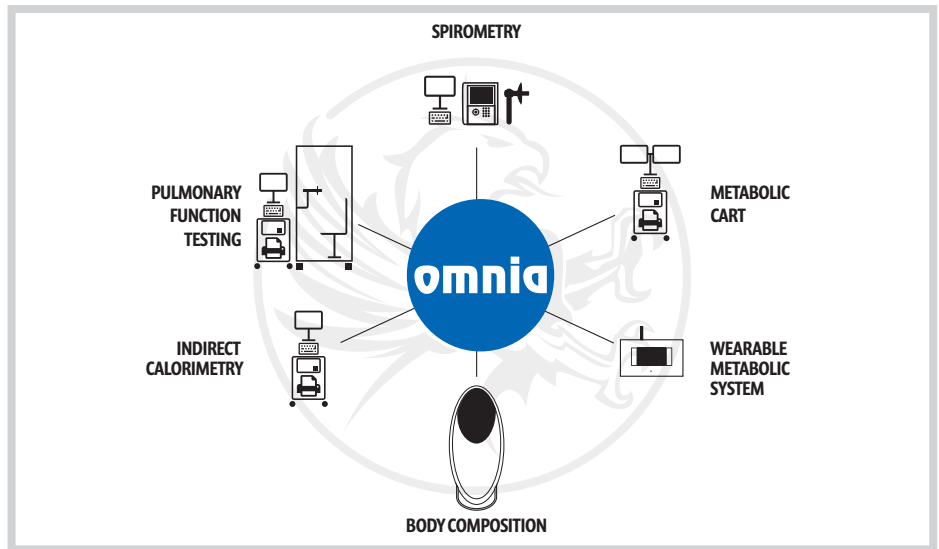
Ref	OMNIA Module	Products Compatibility
C04060-01-11	OMNIA 1.x	
C04160-01-11	OMNIA 1.x w/ Hardware Key	
A-670-100-018	OMNIA Review-only Station	
A-670-100-009	Competitive Data Import	
Pulmonary Function Testing		
A-670-100-001	Spirometry	Spiro line
A-670-100-002	Spirometry	Quark line
A-670-100-003	Lung Volumes - TGV/RAW	Quark PFT/Q-Box
A-670-100-015	Lung Volumes - Nitrogen Washout	Quark PFT
A-670-100-004	Diffusing Lung Capacity	Quark PFT/Q-Box
A-670-100-014	Respiratory Mechanics	Quark PFT/Q-Box/Pony FX (offline)
A-670-100-012	Airway Resistance (Rocc)	Quark PFT/Pony FX (offline)
Metabolic (Exercise & Resting)		
A-670-100-005	Metabolic - CPET/REE	Quark line, K5
A-670-100-022	Metabolic - REE Mask	Quark line, K5
A-670-100-016	Metabolic - REE Canopy	Quark line
A-670-100-006	Metabolic - REE Vent	Quark RMR
A-670-100-010	Misc Ergometers Drivers	Quark line, K5
A-670-100-023	AUX Devices Integration	Quark line, K5
Networking		
C04180-01-11	OMNIA Network 1.x e-license (5 users)	Spiro, Quark, K5
A-670-100-007	OMNIA Network (additional single license)	Spiro, Quark, K5
A-670-100-008	GDT Module	Spiro, Quark, K5
A-670-100-013	HL7 Module	Spiro, Quark, K5

- Ergometers and other peripherals

Each OMNIA client can be connected across the network, user rights and permissions can be easily configured according to the internal organization and to premises layout.

Interfacing with External Devices

Possibility, according the module in use, to interface OMNIA with several external devices like:

- ECG (COSMED, Norav Medical, Mortara)
- Ergometers (wide range of cyclergometers and treadmill from different manufacturers).
- Blood Pressure Monitor (Tango).
- Cardiac Output Monitor (Physioflow).
- Pulseoxymeter (Nonin).
- Patient monitor (Philips Intellibridge).

All data from the external devices are stored into OMNIA database and the software is able to control (if applicable) the device, for example to control a treadmill according to the selected test protocol.

Data Access & Security

OMNIA has been designed to be access and security compliant to the US Health Insurance Portability and Accountability Act (HIPAA) and to ISO 27799:2008, EU 95/46/CE and 2002/58/CE.

- **User Management**: validation of the user identity via password. The Users Management utility allows to create new users directly in OMNIA and to assign the specific role to that account.

- **User Authentication**. OMNIA requires login credentials (user ID and password) to authenticate the access. Beside users, OMNIA also allows to setup ROLES, each ROLE contains a number of permission to access, edit or view a specific software feature.

- The Role Management utility allows to assign one or multiple ROLES to a single USER.

- OMNIA is also compatible with **Microsoft Active Directory,** so Users that are already authenticated in the LAN can automatically login OMNIA without input again credentials.

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| Visit Date | 30/01/2014 |
| Printed On | 30/05/2016 |

Name	SUBJECT DEMO	ID	--	Gender	Male	Age	46	Weight (kg)	78.00	Height (cm)	178.0
Company	COSMED	D.O.B.	04/03/1967	SSN	--	BMI (kg/m2)	24.6	Smoke	No	Years	--	Cig/Day	--
Occupation	demo subject	Operator		Mr. Q	Physician			Dr. House
Ethnic	Caucasian	Room	--	Set	ERS 93 extended (Spirometry), ECCS extended (DLCO), ERS93/ECCS (Body Pletysmography)

Interpretation:

The subject has a FEV1/VC% ratio of 82.3% and a VC value of 6.88 L which are within the normal limits.
No evidence of a diffusion defect is indicated by a diffusing capacity value of 32.98 mL/min/mmHg which is within the normal limits. Test results indicate a NORMAL PULMONARY FUNCTION
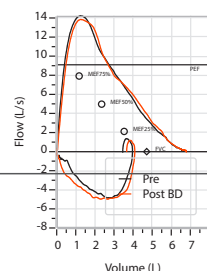
** Unconfirmed ** - Automatically generated interpretation

☐ Confirm Report   **Signature:** _____

Header and patient information (editable logo, header and fields)

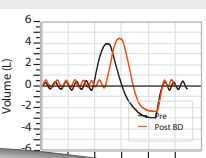*Interpretation string (editable)*

Forced Vital Capacity

| | | PRE | | | | | POST BD (Salbutamol: 400 mcg) | | | | |
		Meas.	Normal Range	Pred	% Pred	z score	Meas.	Change	% Change	% Pred	z score
FVC	L	6.81	3.71 - 5.72	4.72	144		6.85	0.04	1	145	
FEV1	L	5.66	2.99 - 4.67	3.83	148		5.77	0.10	2	151	
FEV1/FVC%	%	83.2	67.1 - 90.7	78.9	105		84.2	1.0	1	107	
PEF	L/s	14.24	7.11 - 11.09	9.10	156		13.85	-0.39	-3	152	
FEF25-75%	L/s	5.84	2.46 - 5.89	4.18	140		6.17	0.34	6	148	
MEF25%	L/s	2.50	0.83 - 3.39	2.11	119		2.76	0.26	10	131	
MEF50%	L/s	6.95	2.80 - 7.14	4.97	140		7.04	0.09	1	142	
MEF75%	L/s	12.43	5.10 - 10.73	7.91	157		13.01	0.58	5	164	
FEV6	L	6.79	4.11 - 5.92	5.01	135		6.86	0.07	1	137	
FEV1/FEV6%	%	83.4	72.0 - 89.9	81.0	103		84.1	0.7	1	104	
MIF/MEF50%	---	0.8	---	-	-	-	0.9	0.1	16	-	-
FEV1/VCmax%	%	82.3	67.1 - 90.7	78.9	104		84.2	1.8	2	107	

For each test users can define list of parameters and columns to display
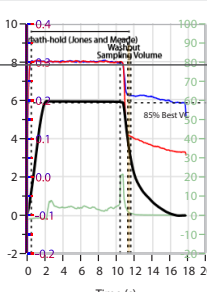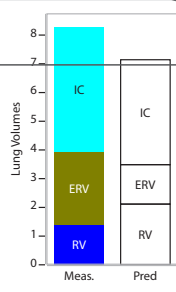
Slow Vital Capacity

| | | PRE | | | | | POST BD (Salbutamol: 400 mcg) | | | | |
		Meas.	Normal Range	Pred	% Pred	z score	Meas.	Change	% Change	% Pred	z score
ERV	L	2.53	---	1.38	184	-	2.19	-0.34	-13	160	-
IC	L	4.36	---	3.65	119	-	4.61	0.25	6	126	-
VC	L	6.88	4.00 - 5.84	4.92	140		6.80	-0.08	-1	138	
IRV	L	3.66	-	-	-	-	3.93	0.27	7	-	-
VT	L(btp)						0.680	-0.016	-2		

		Meas.	Normal Range	Pred	% Pred	z score
DLCO	mL/min/mmHg	33.10	25.04 - 38.92	31.98	104	
DLCO corr	mL/min/mmHg	33.10	25.04 - 38.92	31.98	104	
DLCO/VA	mL/min/mmHg/L	4.09	3.19 - 5.96	4.57	89	
VA	L	8.09	5.84 - 8.14	6.99	116	
TLC(DLCO)	L	8.26	5.99 - 8.29	7.14	116	
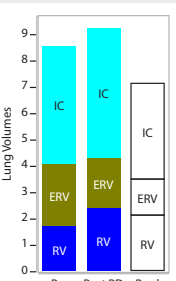
Possibility to enable Z-score (when SD is available in predicteds)

Body Plethysmography

| | | PRE | | | | | POST BD (Salbutamol: 400 mcg) | | | | |
		Meas.	Normal Range	Pred	% Pred	z score	Meas.	Change	% Change	% Pred	z score
sRaw	cmH2O*s	3.32	< 12.00	-	-	-	3.68	0.36	11	-	-
Raw	cmH2O*s/L	0.79	< 2.24	-	-	-	0.84	0.05	7	-	-
sGaw	1/cmH2O/s	0.33	> 0.08	-	-	-	0.29	-0.04	-12	-	-
Gaw	L/cmH2O/s	1.37	> 0.45	-	-	-	1.25	-0.13	-9	-	-
FRC(Pleth)	L	4.09	2.50 - 4.48	3.49	117		4.32	0.23	6	124	
TLC(Pleth)	L	8.58	5.99 - 8.29	7.14	120		9.25	0.67	8	129	
RV(Pleth)	L	1.70	1.44 - 2.79	2.11	80		2.40	0.70	41	113	

Custom "PFT Summary" printout reporting with pictograms, comprehensive interpretation statements, editable charts and tabular data

Networking Architecture

OMNIA Network allows to share a single database in either a small network (LAN) or a large network (WAN) environment.

OMNIA Network is based on a Client/Server architecture and allows to run different COSMED devices through simultaneous access of data.

- The network license includes five clients (with simultaneous access) and it can be extended with the purchase of additional single licenses.
- A user management system allows to define Users (Physician, Technician, Administrator, etc.) and Roles rights.
- OMNIA can exchange data with Hospital Information Systems (HIS) via HL7, GDT or a proprietary Protocol (OCP).
- OMNIA Network runs on Windows Server 2008 (SP2, R2 SP1) and 2012.
- OMNIA database uses MS SQL database (Express or Standard) to store data securely and without any limit on dimension.

Integration with HIS

With the optional **HL7 module** (available with either standalone or network version) OMNIA allows to get data from an HL7 worklist and send results back to Electronic Medical Records (EMR) and Hospital Information Systems (HIS).

The results are automatically sent to HIS (base64 or Network file sharing) whenever the operator has marked the visit as complete. The interface will then send the final result to the EMR either in batches (at user configured intervals) or in real time.

Streamlined Workflow

OMNIA user interface and its workflow management have been designed to simplify procedures and to reduce testing time.

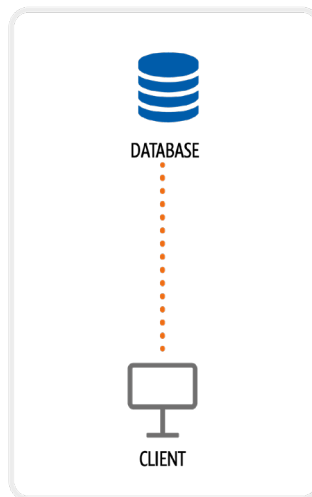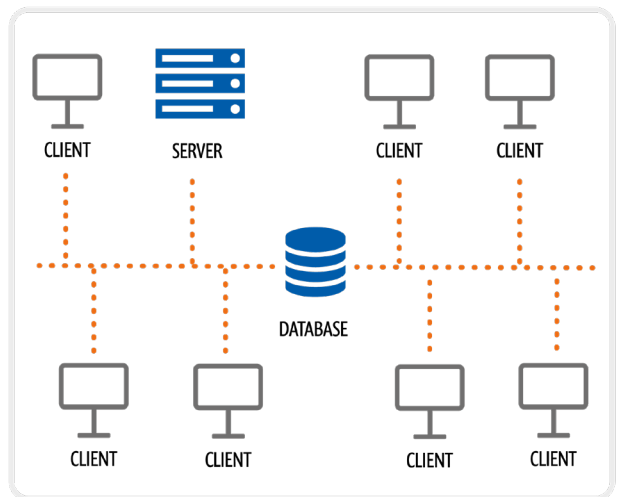A user management system allows to define precisely roles (Physician, Technician, Administrator, etc.) and log all events.

According to its own User rights the operator can:

- register patient's data and setup a visit date
- select and perform one or more tests
- interpret results
- produce report

OMNIA workflow is a bi-directional, reliable and, if required, completely paperless system.

SMALL PRACTICE LAB — STAND ALONE

DEPARTMENT LAB — SMALL/LARGE NETWORK

Available Tests

OMNIA integrates all COSMED medical diagnostics equipment for cardiopulmonary and metabolic functions assessment and body composition measurement.

Each OMNIA workstation can be configured with specific modules/tests and can be easily upgraded at any time.

OMNIA GUI shows features, commands and enables functions according to its configuration. In this way the operator can only see commands and features that can be performed with his own product

- Easily select tests to be carried out
- Access quickly calibration procedures to ensure accurate measurements.
- Uses Standardized Protocols or customize your own via the Built-in Protocol Editors (Metabolic and Broncho-Challenge).
- Easy-to-read tabular data and charts display through multiple dashboard.

- Most of the relevant parameters are shown with Pictograms for an easier and quicker test analysis (both on prints and screen).
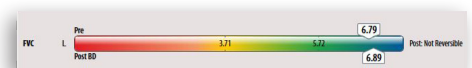
- A powerful algorithm automatically process data and provides an interpretation text strings, including numerical results based on latest scientific guidelines. The interpretation string is fully editable. Additionally, OMNIA features a **Resource Center** that is a repository of a number of frequently used fields (i.e. Diagnosis, statements...), operators can save and use them to avoid repeated operations.
- Large selection of Predicted sets, which are selectable for each test or each single test/patient.
- Data Trend available for each subject for all main measured parameters (absolute, %predicted and z-score).
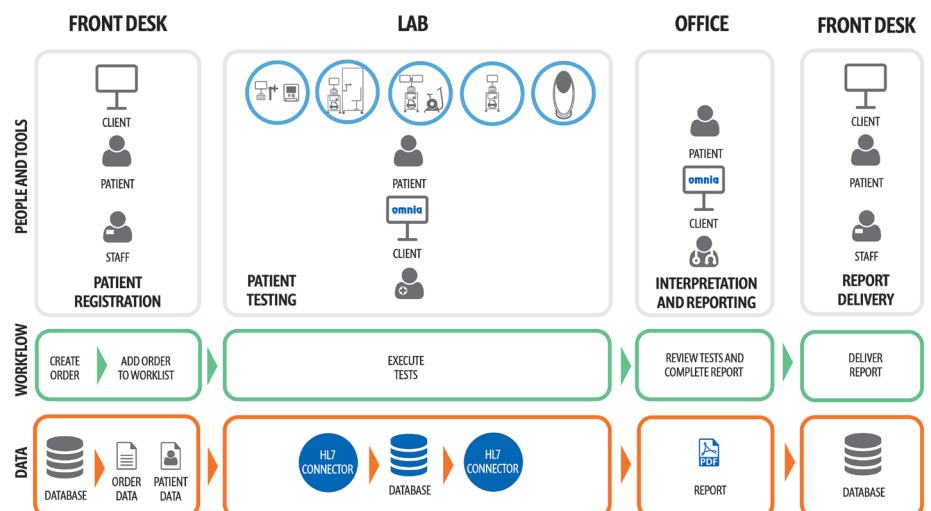
With OMNIA HL7 connector OMNIA can manage the "worklist" of incoming orders from HIS and transfer results back to the centralized system in a PDF file

OMNIA Module	Spirometry	TGV/RAW	FRC/N2WO	DLCO	Resp Mech	Air Res - Rocc	Metabolic - CPET	Metabolic - REE
Compatibility	Spiro, Quark,	Quark PFT, Q-Box	Quark PFT	Quark PFT, Q-Box	Quark PFT, Q-Box	Quark PFT, Pony*	Quark, K5	Quark, K5
Database Management								
SQL database	●	●	●	●	●	●	●	●
Advanced custom query	●	●	●	●	●	●	●	●
Export formats	xml, gdt, pdf	xml, gdt, pdf	xml, gdt, pdf	xml, gdt, pdf	xml, gdt, pdf	xml, gdt, pdf	xml, gdt, pdf, xlsx	xml, gdt, pdf, xlsx
Import formats	xml, gdt	xml, gdt	xml, gdt	xml, gdt	xml, gdt	xml, gdt	xml, gdt	xml, gdt
Competitive data import	○	○	○	○	○	○	○	○
DB converter	●	●	●	●	●	●	●	●
Offline data input	●	●	●	●	●	●	●	●
Backup/Restore database	●	●	●	●	●	●	●	●
Testing								
Available tests	FVC Pre/Post SVC Pre/Post, MVV, Broncho-challenge	TGV/RAW Pre/Post RAW Challenge	N_2WO Multi-breath, N_2WO Single breath	DLCO Single Breath, DLCO Intrabreath	MIP, MEP P0.1	Rocc Pre Rocc Post BD	CPET BxB CPET Mix Chamber	REE Canopy REE Mask, REE Ventilator
Available predicted sets	46 (spiro) 6 (6MWT)	8	6	14	4	5	12 (clinical) 4 (healthy)	5
Pediatric incentivation	●							
Data filtering (smoothing, average)							●	●
Post-test edit	Best Exp/Insp (FVC), VT interval (SVC)	Interval (FRC) Slope (RAW) Intercept (RAW)	Final $FetN_2$ (MB) Phases (SB)	Washout Volume Sampling Volume	Interval (MIP/MEP) Accept/discard measure (P0.1)	Best captures	VO_2max/Sub-Max AT Points (2) VE/VCO_2, slopes EFVL	Multi- Interval (AVG REE)
Protocols editor	Broncho challenge						Exercise	Resting
Quality control (system & operator)	●	●	●	●	●	●		
User-defined dashboards							●	●
User additional info				Hb, CO_{Hb} (post test)			ABG, Dyspnea, Leg	AMR, UN (post test)
Guidelines	ATS/ERS 2005	ATS/ERS 2005	ATS/ERS 2005	ATS/ERS 2005	ATS/ERS 2001	ATS/ERS 2007	ATS/ACCP, EACPR/ AHA, ACSM	ADA, ESPEN/ ASPEN, AARC
Device Interfaces								
Bikes							COSMED, Ergoline, Monark	
Treadmill							COSMED, h/p cosmos, Trackmaster	
Miscellaneous ergometer control							○	
Interface with external devices	Dosimeter					Rocc kit	SpO_2, ECG	Intellibridge
AUX device integration							NiBP, Cardiac Output	
Calibrations								
Flowmeter	Calibration, Check, Linearize (PNT)	Calibration, Check, Linearize (PNT)	Calibration, Check, Linearize (PNT)	Calibration, Check, Linearize (PNT)	Calibration, Check, Linearize (PNT)	Calibration, Check	Calibration	Calibration
Other calibrations		Box Calibration Leakage check	Gas (O_2, CO_2)	Gas (CO, CH_4)			Ref Gas (O_2, CO_2) Mix Chamber Zero Cal	Exercise % (O_2, CO_2) ICU% (O_2, CO_2)
Calibration archive	●	●	●	●	●	●	●	●
Reporting								
Custom report	●	●	●	●	●	●	●	●
Custom header	●	●	●	●	●	●	●	●
Batch printing	●	●	●	●	●	●	●	●
Pictogram gauges	FVC, FEV_1, FEV_1/ FVC%, IC, MVV	sRAW, TLC(Pleth)	FRC, TLC(N_2WO)	$DLCO_{corr}$, DLCO/VA	MIP, MEP	Rocc Exp Rocc Insp	VO_2, IC	RMR
Z-score	●	●	●	●	●	●	●	●
Trends (absolute, %pred, z-score)	●	●	●	●	●	●	●	●
Automatic interpretation	●	●	●	●	●	●	●	●
Other Tools								
RSS feed (internet required)	●	●	●	●	●	●	●	●
Event log	●	●	●	●	●	●	●	●
Resources center	Physician, Operator, Company, Reason for stopping test, Users comments							
Security & Privacy								
Compliance	US Health Insurance Portability and Accountability Act (HIPAA), ISO 27799:2008, EU 95/46/CE and 2002/58/CE							
Users/Roles management	●	●	●	●	●	●	●	●
Networking								
Clinet/Server networking	○	○	○	○	○	○	○	○
Microsoft Active Directory	○	○	○	○	○	○	○	○
GDT connection	○	○	○	○	○	○	○	○
Integration via HL7	○	○	○	○	○	○	○	○

System Requirements

Hardware	
CPU	Intel Core i3 series or higher (Intel Core i5 recommended)
RAM	4 GB or greater (8GB recommended)
Disk space	10 GB available for full installation (SSD recommended)
Database Size	10 GB maximum dimension with SQL Express (freeware)
	Unlimited with SQL Standard (license to be purchased from Microsoft)
Monitor resolution	Screen resolution 1366x768 or greater (1920x1080 recommended)
Ports	USB (>2 recommended)
	RS-232 (for remote control of ergometers and K4 b^2)
	Bluetooth (K5)
	AUX display ports
	Other drives (CD/DVD-ROM for installation)
Printer	PCL3 or higher language and connected via USB
3rd party software required	Acrobat Reader (for manual reading) Excel MS Office 2007 .xlsx (for data export)

OMNIA Standalone Workstation or Client (Networking)	
OS Compatibility	Windows 7 SP1 (32/64 bit), Windows 8.x (32/64 bit), Windows 10 (32/64bit)
CPU	Intel Core i3 series or higher (Intel Core i5 recommended)
RAM	4 GB or greater (8GB recommended)
Disk space	HD with 4GB of free space (SSD recommended) 850 MB (x86) or 2 GB (x64) for Microsoft Framework
Other drive	CD/DVD-ROM for installation
3rd party software required	Acrobat Reader (for manual reading) Excel MS Office 2007 .xlsx (for data export)

OMNIA Server (Networking)	
OS Compatibility	Windows Server 2008 SP2, 2008 R2 SP1, 2012, 2012 R2
Virtual Machine Support	Yes
64 bit OS Support	Yes
OMNIA SQL Database	1 GB for SQL Server 2014 SP1 30 MB for SQL Server 2014 Shared Management Object and SQL 2014 System CLR Types

To know more: